

**UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK**

NORTHWEST BIOTHERAPEUTICS, INC.,

Plaintiff,

- against-

CANACCORD GENUITY LLC, CITADEL
SECURITIES LLC, G1 EXECUTION
SERVICES LLC, GTS SECURITIES LLC,
INSTINET LLC, LIME TRADING CORP.,
and VIRTU AMERICAS LLC.

Defendants.

Civil Action: 1:22-cv-10185-GHW-GS

SECOND AMENDED COMPLAINT

JURY TRIAL DEMANDED

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Plaintiff Northwest Biotherapeutics Inc. (“NWBO,” the “Company,” or “Plaintiff”), by and through its undersigned attorneys, Cohen Milstein Sellers & Toll PLLC, and for its complaint against Canaccord Genuity LLC (“Canaccord”), Citadel Securities LLC (“Citadel”), G1 Execution Services LLC (“G1”), GTS Securities LLC (“GTS”), Instinet LLC (“Instinet”), Lime Trading Corp. (“Lime Trading”), and Virtu Americas LLC (“Virtu,” and collectively “Defendants”), alleges upon personal knowledge, information and belief, and an investigation by counsel as follows:

I. SUMMARY OF CLAIMS

1. This case arises from Defendants’ scheme to manipulate NWBO’s share price during the period of December 5, 2017 to August 1, 2022 (the “Relevant Period”). Throughout the Relevant Period, Defendants deliberately engaged in repeated spoofing that interfered with the natural forces of supply and demand, and repeatedly drove NWBO’s share price downward. Defendants’ manipulation violates Section 10(b), Rule 10b-5 and Section 9(a)(2) of the Securities Exchange Act of 1934, and constitutes fraud under New York state common law.

2. NWBO is a clinical stage biotechnology company focused on the development of personalized cancer vaccines designed to treat a broad range of solid tumor cancers more effectively than current treatments, and without the side effects of chemotherapy, through a proprietary manufacturing technology which enables the Company to produce a personalized vaccine in an efficient and cost-effective manner. The Company’s lead product, DCVax®-L, received the first-ever “Promising Innovative Medicine” designation under the United Kingdom’s “Early Access to Medicines Scheme” on September 16, 2014.

3. NWBO recently completed a 331-patient Phase 3 clinical trial of DCVax®-L in the United States, Canada, United Kingdom, and Germany for patients with glioblastoma multiforme

(“GBM”), the most aggressive and lethal form of brain cancer.

4. On May 10, 2022, positive top-line results from the clinical trial were presented at the Frontiers of Cancer Immunotherapy Conference of the New York Academy of Sciences, showing that DCVax®-L had reached both its primary and its secondary endpoints with statistical significance under the Statistical Analysis Plan for the Phase 3 trial. The survival data of the trial was promising; no other GBM trial in decades has shown such improvements in both median survival and the “long tail” of extended survival in both newly diagnosed and recurrent (late stage) GBM patients. The safety data was similarly excellent, showing that DCVax®-L’s safety profile was not meaningfully different than with standard of care alone. In addition to these results from the Phase 3 trial, DCVax®-L is also expected to have broader value in the future, through: (i) potential combinations with a wide range of other types of treatments; (ii) potential application to *any type* of solid tumor (*i.e.*, a tumor in any tissue); and (iii) being feasible to administer in community settings (where most cancer patients are treated), as well as in major cancer centers.

5. Then, on November 17, 2022, *JAMA Oncology* – the highly respected, peer-reviewed cancer journal – published and featured an article entitled “Association of Autologous Tumor Lysate-Loaded Dendritic Cell Vaccination with Extension of Survival Among Patients with Newly Diagnosed and Recurrent Glioblastoma,” co-authored by over 70 physicians from leading institutions across the U.S., Canada, United Kingdom, and Germany regarding the final results of the Phase 3 trial of DCVax®-L. As reported in *JAMA Oncology*, the trial results demonstrated that DCVax®-L was “associated with a clinically meaningful and statistically significant extension of overall survival” and “also had an excellent safety profile and noteworthy tails of long-term

survival curves.”¹ The Company believes that this is the first Phase 3 trial of a systemic treatment in nearly 20 years to have shown such survival extension in newly diagnosed GBM patients, and the first time in nearly 30 years that a Phase 3 trial of any type of treatment has shown such survival extension in recurrent GBM.

6. Most recently, on March 20, 2023, NWBO announced that, together with Advent BioServices, the Company’s contract manufacturer in the United Kingdom, it received a license from the U.K. Medicines and Healthcare Products Regulatory Agency for the commercial manufacturing of cell therapy products at its facility in Sawston, United Kingdom. This commercial manufacturing license, referred to as an MIA license, allows for the importation into the U.K. of products to produce or release cell therapy products and the global export of cell therapy products manufactured at the Sawston facility, and is a critical and essential step toward regulatory approval of DCVax®-L in the United Kingdom. NWBO believes its MIA license is one of only three such licenses approved and issued in the United Kingdom for the commercial manufacturing of cell therapy products.

7. Despite the string of encouraging news about its lead product, NWBO’s share price has not followed suit. Quite the opposite actually – and that is not by chance. Rather, because of Defendants’ spoofing, NWBO’s share price has dropped.

8. Spoofing is a form of market manipulation that, in this case, was accomplished by

¹ Liao LM, Ashkan K, *et al.*, Association of Autologous Tumor Lysate-Loaded Dendritic Cell Vaccination With Extension of Survival Among Patients With Newly Diagnosed and Recurrent Glioblastoma: A Phase 3 Prospective Externally Controlled Cohort Trial. *JAMA Oncol.*, Nov.17, 2022, available at <https://jamanetwork.com/journals/jamaoncology/fullarticle/2798847>.

placing “Baiting Orders” in the Limit Order Book² or Inter-Dealer Quotation System (“IDQS”)³ that are not intended to be executed and have no legitimate economic purpose.⁴ The purpose of these Baiting Orders is to create a false illusion of market interest (either positive or negative) that will generate a response from other market participants that the spoofers can use to their advantage. For example, if the goal of the spoofing scheme is to drive the price down, the spoofer enters Baiting Orders to sell, to create an appearance of a downward trending market, which will then bait other market participants into entering their own sell orders to minimize or avoid suffering losses. Shortly thereafter, the spoofer will place orders to buy, or “Executing Purchases,” which

² A “Limit Order Book” is an electronic list of buy and sell orders for specific securities and other financial instruments that is organized by price levels and lists the number of shares being bid or offered at each price point. The Limit Order Book reflects whether the market price for the security is moving upwards or downwards and is visible to every trader on the exchange.

³ An IDQS provides “bid and ask quotations of participating brokers or dealers, or comparably accurate and reliable pricing information, which shall constitute firm bids or offers for at least such minimum numbers of shares or minimum dollar amounts as the Commission and the registered securities association or national securities exchange shall require.” 15 U.S.C. § 78q-2(b)(2)(C). According to FINRA, Eligible IDQS include NYSE Global OTC and OTC Link LLC. Letter from J. Matthew DeLesDernier, Assistant Secretary, SEC, to Robert Colby, Executive Vice President and Chief Legal Officer, FINRA, dated June 21, 2021.

⁴ There are certain technical differences between an IDQS and a Limit Order Book. For example, unlike on the Limit Order Book, orders are not executed *on* the IDQS but rather executions occur through dealer-to-dealer communications networks. These executions, however, take place at the prices of the “firm bids or offers” displayed on the IDQS. “Firm bids or offers” displayed on IDQS are no less binding than Limit Orders and have the same economic effect on the market as Limit Orders. For this reason, this Complaint does not distinguish between orders displayed in a Limit Order Book like Global OTC and quotes displayed on an IDQS. Another difference between an IDQS and Limit Order Book is that the latter only allows market participants to display their best bid and best offer. As a result, an IDQS is *more* vulnerable to spoofing than Global OTC. Just as with a Limit Order Book, when a quote or order is cancelled, market participants have no assurance that it will be “redisplayed” in the future. But unlike a Limit Order Book, market participants have no other information regarding the seller’s willingness to transact at prices other than the newly quoted price. An IDQS like OTC Link is thus equivalent to a Limit Order Book where each market participant is allowed to show only one order (their best one) on each side of the order book. For this reason, the price impact of a Baiting Order on an IDQS is expected to be greater because the quote is *all* the information available to the market at each point in time.

are intended to be executed against the other market participants' sell orders at the lower artificial prices prompted by the false Baiting Orders to sell. Immediately after placing these Executing Purchases to buy, the spoofer then cancels all of the Baiting Orders to sell, which completes the profitable spoofing cycle.

9. This scheme can be used multiple times during a trading day, and then repeated throughout a protracted trading period. To maximize the speed of their market access and execution of their trading strategies, spoofers typically utilize algorithmic trading programs through high-frequency trading computer systems which enable thousands of Baiting Orders to be placed in a matter of seconds and sometimes milliseconds.

10. During the Relevant Period, Defendants engaged in spoofing to manipulate the price of NWBO shares on OTC Link LLC and NYSE ARCA Global OTC, thus creating an imbalance in the market for NWBO shares and inducing other market participants to buy or sell at artificial prices. In order to carry out their spoofing scheme, Defendants placed tens of millions of Baiting Orders and executed millions of orders at manipulated prices during the Relevant Period. Indeed, Defendants engaged in spoofing on 395 of 1,171 – or nearly 34% – of the trading days and on at least 2,849 occasions during the Relevant Period.

11. Plaintiff NWBO sold over 274 million shares at manipulated prices as a result of Defendants' actions, over 40 million shares of which were sold at the closing price on dates where Spoofing Episodes occurred. By repeatedly and brazenly manipulating the market through their spoofing, Defendants directly impacted the price of NWBO's shares in the market, causing Plaintiff significant losses as it sold millions of shares of NWBO stock at artificially depressed prices.

II. JURISDICTION AND VENUE

12. This Court has jurisdiction over the subject matter of this action pursuant to Section 27 of the Exchange Act, 15 U.S.C. § 78aa and 28 U.S.C. § 1331. This Court also has jurisdiction over the state law claims under 28 U.S.C. § 1367 because those claims are so related to the federal claim that they form part of the same case or controversy.

13. This Court has personal jurisdiction over each Defendant. Each Defendant either maintained its business offices and conducted a substantial part of the events asserted in this complaint in this District or directed its fraudulent activity into this market by manipulating NWBO stock on the OTC Link LLC and NYSE ARCA Global OTC, both of which are located in this District. The unlawful acts committed by Defendants had a direct and substantial impact on the market price of NWBO shares traded in this District in the United States.

14. Venue is proper in the Southern District of New York pursuant to 28 U.S.C. § 1391 and Section 27 of the Exchange Act, in that many of the acts, transactions and occurrences alleged herein occurred in this District, and all of the Defendants conducted business here in connection with the events described herein. Defendants directly or indirectly made use of the means or instrumentalities of interstate commerce including the mails in connection with the conduct alleged herein.

III. THE PARTIES

A. Plaintiff

15. Plaintiff NWBO is a clinical stage biotechnology company focused on the development of personalized cancer vaccines designed to treat a broad range of solid tumor cancers more effectively than current treatments, and without the side effects of chemotherapy. It was founded in 1996 in Seattle, Washington, and later moved its headquarters to Maryland. NWBO is

a publicly traded company with a market cap of approximately \$650 million as of the filing of this Complaint, whose shares trade in New York on OTC Link LLC and NYSE ARCA Global OTC. During the Relevant Period, NWBO sold over 274 million shares of NWBO at depressed prices as a result of Defendants' illegal manipulation.

B. Defendants⁵

1. Defendant Canaccord

16. Defendant Canaccord is headquartered at 535 Madison Avenue, New York, New York. Defendant Canaccord is a registered broker-dealer that executes securities transactions on the various trading venues in the U.S., and is an independent provider of third party algorithms. As of June 2022, Defendant Canaccord possessed market making capability for over 2,500 companies.

17. Among other regulatory actions, in 2019, the SEC found that Defendant Canaccord improperly enabled trading in dozens of thinly-traded securities without conducting the review required by the federal securities laws, including by improperly publishing quotes and making markets in dozens of over-the-counter securities. Defendant Canaccord agreed to be censured and paid a \$250,000 penalty for that matter.

18. Defendant Canaccord conducted continuous activity in New York, directly related to these claims, by employing high speed algorithmic computer systems to route orders and execute trades of NWBO shares throughout the U.S., including in New York, on trading venues in the U.S.

⁵ Whenever reference is made to any act, device, contrivance, or scheme to manipulate NWBO securities by any of the Defendants, the allegation is intended to also include the subsidiaries, affiliates, sister companies, agents and representatives of that Defendant, whose identities and specific involvement in this market manipulation case are unknown to Plaintiff at this time. Only after discovery is taken will their identities and involvement become known.

2. *Defendant Citadel*

19. Defendant Citadel is headquartered at 200 South Biscayne Boulevard, Miami, Florida. Defendant Citadel is a registered broker-dealer that executes securities transactions on the various trading venues in the U.S. Founded and majority owned by multi-billionaire Kenneth C. Griffin, Defendant Citadel is one of the largest market makers in the world in a variety of markets. Defendant Citadel's automated equities platform trades over 20% of U.S. equities volume across more than 11,000 U.S.-listed securities and trades over 16,000 OTC securities and executes approximately 35% of all U.S.-listed retail volume, making it the industry's top wholesale market maker. Defendant Citadel claims its "proprietary algorithms are designed to maximize efficiency by continuously optimizing order placement and accessing our principal liquidity." Mr. Griffin is also the founder and majority owner of Citadel LLC, one of the world's largest hedge funds with investment capital of over \$57 billion as of September 1, 2022, that claims to use "advanced statistical and quantitative modeling techniques to the petabytes of historical and current data we collect to identify and capture investment opportunities."

20. Among other regulatory actions, in 2017, the SEC found that Citadel made misleading statements in violation of Section 17(a)(2) of the Securities Act to retail consumers, including that upon receiving retail orders they forwarded from their own customers, it either took the other side of the trade and provided the best price that it observed on various market data feeds or sought to obtain that price in the marketplace. Defendant Citadel agreed to be censured and pay \$5.2 million in disgorgement of ill-gotten gains, plus interest of \$1.4 million, and a penalty of \$16 million for its conduct. In 2020, Defendant Citadel was fined \$700,000 by the Financial Industry Regulatory Authority ("FINRA") to settle allegations that it traded ahead of certain client equity orders and failed to establish a supervisory process to ensure it did not trade ahead of customers'

orders. And in January of 2023, Defendant Citadel was fined nearly \$10 million by the South Korea financial regulator, the Financial Services Commission, for distorting stock prices with artificial factors, such as orders on the condition of “immediate or cancel” and by filling gaps in bid prices, on over 1,400 stocks a day from October 2017 to May 2018, totaling more than 500 billion won worth of trades, using high speed trading algorithms.

21. Defendant Citadel conducted continuous activity in New York, directly related to these claims, by employing high speed algorithmic computer systems to route orders and execute trades of NWBO shares throughout the U.S., including in New York, on trading venues in the U.S.

3. Defendant GTS

22. Defendant GTS is headquartered at 545 Madison Avenue, New York, New York. Defendant GTS is a registered broker-dealer that executes securities transactions on the various trading venues in U.S. Defendant GTS is a global electronic market maker. As a quantitative trading firm, Defendant GTS leverages the latest in artificial intelligence systems and sophisticated pricing models. Defendant GTS accounts for 3-5% of daily cash equities volume in the U.S. and trades over 30,000 different instruments globally.

23. Among other regulatory actions, in 2020, Defendant GTS was fined by a number of exchanges a total of \$70,000 to settle allegations that it failed to comply with certain regulations regarding short sale transactions. In 2022, CBOE BYX Exchange Inc. censured and issued a \$10,000 penalty against Defendant GTS, finding that Defendant GTS had unreasonable controls in place to prevent erroneously priced limit orders from being entered on its exchange.

24. Defendant GTS conducted continuous activity in New York, directly related to these claims, by employing high speed algorithmic computer systems to route orders and execute trades of NWBO shares throughout the U.S., including in New York, on trading venues in the U.S.

4. Defendant Instinet

25. Defendant Instinet is headquartered at 309 West 49th Street, New York, New York. Instinet is a registered broker-dealer that executes securities transactions on the various trading venues in the U.S. A part of Nomura Group, Instinet offers advanced algorithmic trading strategies which are operated and monitored in real time by Instinet's global support organization using advanced reporting, alerting and control software.

26. Among other regulatory matters, in 2018, FINRA, BOX, Cboe, IEX, Nasdaq and NYSE fined Defendant Instinet \$1.575 million for failing to detect and prevent potentially violative and manipulative trading activity. FINRA and the Exchanges further found that Defendant Instinet failed to implement financial and regulatory risk management controls and procedures reasonably designed to prevent the entry of erroneous or duplicative orders, orders that exceeded appropriate pre-set credit or capital thresholds, or erroneous messaging activity resulting from malfunctioning customer algorithms and trading systems.

27. Defendant Instinet conducted continuous activity in New York, directly related to these claims, by employing high speed algorithmic computer systems to route orders and execute trades of NWBO shares throughout the U.S., including in New York, on trading venues in the U.S.

5. Defendant Lime Trading (f/k/a Score Priority Corp.)

28. Defendant Lime Trading (f/k/a Score Priority Corp.) is headquartered at 1 Penn Plaza, 16th Floor, New York, New York. Defendant Lime Trading renamed itself from Score Priority Corp. in March 2022. Defendant Lime Trading is a registered broker-dealer that executes securities transactions on the various trading venues in the U.S. It offers low latency, Direct Market Access technology, which executed over 20 billion trades and processed more than 10 billion messages last year.

29. Among other regulatory actions, in 2019, FINRA censured and fined Defendant Lime Trading \$625,000 for improperly failing to detect that its direct market access customers were engaging in manipulative trading, including a variety of practices, such as “layering,” “spoofing,” “ramping,” and “marking.”

30. Defendant Lime Trading conducted continuous activity in New York, directly related to these claims, by employing high speed algorithmic computer systems to route orders and execute trades of NWBO shares throughout the U.S., including in New York, on exchanges in the U.S.

6. Defendant G1

31. Defendant G1 is headquartered in Chicago at 175 West Jackson Boulevard, Chicago, Illinois. Defendant G1 is a registered broker-dealer that executes securities transactions on the various trading venues in the U.S.

32. Among other regulatory actions, in 2021 FINRA censured and ordered Defendant G1 to pay a \$575,000 fine and \$816,618.75, plus interest, in restitution to its customers for failing to provide best execution to the firm’s clients in the over-the-counter market, including by failing to use reasonable diligence to ascertain the best market for the subject securities and by failing to buy or sell in such a market so that the resultant prices to the customers were as favorable as possible under prevailing market conditions.

33. Defendant G1 conducted continuous activity in New York, directly related to these claims, by employing high speed algorithmic computer systems to route orders and execute trades of NWBO shares throughout the U.S., including in New York, on trading venues in the U.S.

34. Defendant G1 was purchased by Susquehanna International Group LLP in 2014, and was previously owned by E*Trade Financial Corp. (“E*Trade”) under the name E*Trade

Capital Markets.

7. Defendant Virtu

35. Defendant Virtu is headquartered at 1633 Broadway Avenue, New York, New York. Defendant Virtu is a registered broker-dealer that executes securities transactions on the various trading venues in the U.S. Virtu is a global provider of market making and execution services and earned \$1.9 billion in net trading income in 2021.

36. Among other regulatory actions, in 2020, FINRA fined Defendant Virtu \$175,000 and Defendant Virtu paid \$164,137.70 in restitution for not providing best execution on 13,136 orders, finding that it failed to use reasonable diligence to ascertain the best market for the subject securities and to buy or sell in such a market so that the resultant prices to the customers were as favorable as possible under prevailing market conditions. That same year, FINRA censured and fined Defendant Virtu \$250,000 because it did not reasonably avoid displaying or engaging in a pattern or practice of displaying, locking or crossing quotations in over-the-counter equity securities and did not immediately execute, route or display customer limit orders in over-the-counter equity securities.

37. Defendant Virtu conducted continuous activity in New York, directly related to these claims, by employing high speed algorithmic computer systems to route orders and execute trades of NWBO shares throughout the U.S., including in New York, on trading venues in the U.S.

* * *

38. The spoofing activity that forms the basis of the claims in this action may have been executed by Defendants for their own accounts, for which they acted as dealers, or for client accounts, for which they acted as brokers. In either scenario, Defendants' spoofing activity is in violation of the federal securities laws.

IV. NWBO'S BUSINESS AND LIFE-SAVING CANCER VACCINES

39. NWBO's proprietary, breakthrough technology involves producing personalized cancer vaccines that are designed to treat a broad range of solid tumor cancers more effectively than current treatments and without the side effects of chemotherapy. NWBO's platform technology "DCVax®" uses activated dendritic cells to mobilize a patient's own immune system to attack the cancer. NWBO's lead platform technology, DCVax®-L, is designed to treat solid tumor cancers in which the tumor can be surgically removed. NWBO's additional platform technology, DCVax®-Direct, is designed to treat inoperable cancers.

40. Glioblastoma multiforme brain cancer, or GBM, is a highly lethal form of brain cancer that strikes all ages, affecting over 12,000 patients in the United States alone each year. Glioblastomas are grade IV primary brain tumors, meaning they are the most aggressive and lethal. Standard of care for treatment of GBM has been virtually unchanged for nearly 20 years. There is currently no cure for GBM. The median overall survival is just 15-17 months from diagnosis, and the 5-year survival rate is generally less than 5%.

41. As a glioblastoma grows, it forms microscopic branches that spread and infiltrate into the brain tissue around the tumor's location. These branches make it nearly impossible to remove the entire tumor surgically. In addition, a single tumor contains many different types of cells, so a drug that works against some cells may not successfully treat the entire tumor.

42. The current standard of treatment for newly diagnosed GBM is surgery, followed by daily radiation of the brain and daily oral chemotherapy for six weeks, then monthly chemotherapy. For recurrent (late stage) GBM, there is no established standard of care. Following initial surgery, glioblastoma tumors typically recur in 6 to 8 months. When a tumor recurs, patients generally do not receive further radiation treatments as they have already received a "lifetime dose"

of radiation to the brain when they were newly diagnosed. Median survival after tumor recurrence is less than one year and long-term survival is extremely rare. Further, the existing treatments have debilitating side effects. Overall, the clinical picture with GBM is particularly bleak: there have been more than 400 clinical trials for GBM since 2005 involving more than 32,000 patients testing diverse treatment modalities, but only one prior Phase 3 trial in that time has demonstrated a survival benefit for newly diagnosed GBM, and no prior Phase 3 trials in those decades have demonstrated a survival benefit for recurrent GBM.

43. DCVax®-L – the Company’s leading product – is a fully personalized immune therapy made from a patient's own immune cells (dendritic cells) and antigens (biomarkers) from a sample of the patient's own tumor. A multi-year set of doses is produced in a single manufacturing batch, which takes 8 days. The product is then stored frozen in individual doses, and is “off the shelf” throughout the treatment regimen. The doses are stored centrally and simply taken out of the freezer and delivered to the physician when needed for the patient’s next treatment. Administration of DCVax®-L is quite simple for both the physician and patient: just an intradermal injection in the upper arm, 6 times over the course of the first year, and then twice a year for maintenance thereafter.

44. The Company completed a 331-patient international Phase 3 clinical trial of DCVax®-L for GBM. The data collection and confirmation process for the trial was conducted by an independent contract research organization who managed the trial, in addition to other independent service firms. This process included the implementation of, and adherence to, rigorous protocols.

45. On May 10, 2022, Dr. Paul Mulholland, an independent physician who participated in the Phase 3 trial, presented the overall survival data and top-line results for the DCVax®-L

Phase 3 trial at the New York Academy of Sciences. In this presentation, NWBO announced that its lead drug, DCVax®-L, had reached both its primary and its secondary endpoints under the Statistical Analysis Plan, with statistical significance, in the trial. No other GBM trial in many years has shown such improvements in both median survival and the “long tail” of extended survival for both newly diagnosed and recurrent GBM patients. The safety data was similarly promising, showing that the safety profile of DCVax®-L was not meaningfully different from standard of care alone. In addition to these results from the Phase 3 trial, DCVax®-L is also expected to have broader value in the future through: (i) potential combinations with wide range of other treatments; (ii) potential application to any type of solid tumor (*i.e.*, a tumor in any tissue); and (iii) being feasible to administer in community settings (where most cancer patients are treated) as well as in major cancer centers. The Company believes this is the first Phase 3 trial to demonstrate any survival benefit from a systemic treatment for newly diagnosed GBM since the approval of Temozolomide in 2005, and the first Phase 3 trial to demonstrate a survival benefit for recurrent GBM in nearly 30 years. The fact that DCVax®-L can potentially be applied to the treatment of any type of solid tumor is similarly groundbreaking, and would greatly expand the potential use of DCVax®-L in the United States and worldwide.

46. On August 17, 2022, NWBO received approval from the UK Medicines and Healthcare Products Regulatory Agency for the Company’s Pediatric Investigation Plan (“PIP”). The development, regulatory review and regulatory approval of a PIP is a pre-requisite for application for approval of a new medicine for adult patients, such as DCVax®-L. The Company’s approved PIP includes 2 clinical trials: one for newly diagnosed pediatric high-grade glioma brain cancer (“HGG”), and one for recurrent pediatric HGG. In each of the 2 pediatric trials, the patients will be treated with DCVax®-L on the same treatment schedule as in the Company’s Phase 3 trial

in adult GBM patients, and the pediatric trials will use the same trial design with external controls as in the Statistical Analysis Plan for the Phase 3 trial that NWBO has completed in adult patients.

47. NWBO is currently working with teams of expert consultants on preparations for filing applications for regulatory approval to bring DCVax®-L to market for patients.

48. Then, on November 17, 2022, the prestigious, peer-reviewed cancer journal *JAMA Oncology* published an article regarding the final results of the Phase 3 clinical trial of DCVax®-L. The article was co-authored by over 70 physicians from leading institutions across the U.S., Canada, U.K., and Germany. The article reported that both median survival and the “long tail” of extended survival were increased in both newly diagnosed and recurrent GBM patients treated with DCVax®-L. The Company believes this is the first time in nearly 20 years that a Phase 3 trial of a systemic treatment has shown such survival extension in newly diagnosed GBM, and the first time in nearly 30 years that a Phase 3 clinical trial of any type of treatment has shown such survival extension in recurrent GBM. Specifically, median Overall Survival (mOS) for newly diagnosed GBM patients (n=232) was 19.3 months from randomization (22.4 months from surgery) with DCVax®-L, versus 16.5 months from randomization in the controls (HR=0.80, p=0.002). Survival at 48 months from randomization was 15.7% vs. 9.9%, and at 60 months was 13% vs. 5.7%.

49. The safety profile of the vaccine was extremely positive as well. Unlike chemotherapy and radiotherapy, the vast majority of patients reported no serious adverse events from the immunotherapy vaccine. Out of more than 2,100 doses of DCVax®-L administered during the Phase III trial, there were only 5 serious adverse events that were deemed at least possibly related to the treatment. There were 3 cases of intracranial edema, 1 case of nausea and 1 case of lymph node infection.

50. The public responded positively to the news: among others, *The Guardian* described the trial results as “astonishing”;⁶ *The Telegraph* stated that this was the “first major breakthrough for decades”;⁷ and CNBC declared that the trial offered “fresh hope” to brain cancer patients, noting that one patient in particular survived for eight more years.⁸

51. Most recently, on March 20, 2023, NWBO announced that it received a license from the U.K. Medicines and Healthcare Products Regulatory Agency for the commercial manufacturing of cell therapy products at its facility in Sawston, United Kingdom, allowing for the importation into the United Kingdom of products to produce or release cell therapy products and the global export of cell therapy products manufactured at the Sawston facility.

52. The illegal market manipulation of NWBO stock by Defendants has significantly impaired the ability of the Company to raise funds from the public markets and could impact the ability of the Company to get these life-saving cancer treatments quickly to market. The Company’s DCVax®-L treatment more than doubled the percentage of 5-year survivors with this extremely aggressive brain cancer in the Phase 3 trial, and it offers patients and their loved ones significant new hope for the first time in a long time. But, Defendants’ illegal market manipulation, done solely for the purpose of reaping substantial, illegal ill-gotten gains, could deprive cancer patients of this important chance for additional years of life.

⁶ Vaccine shown to prolong life of patients with aggressive brain cancer, *The Guardian*, Nov. 17, 2022, available at <https://www.theguardian.com/science/2022/nov/17/vaccine-shown-to-prolong-life-patients-aggressive-brain-cancer-trial-glioblastoma>.

⁷ Vaccine doubles brain tumour survival rate in medical breakthrough, *The Telegraph*, Nov. 17, 2022, available at <https://www.telegraph.co.uk/news/2022/11/17/vaccine-doubles-brain-tumour-survival-rate-medical-breakthrough/>.

⁸ Vaccine trial for brain cancer patients offered “fresh hope,” *CNBC*, Nov. 18, 2022, available at <https://www.cnbc.com/healthcare/vaccine-breakthrough-can-prolong-life-in-brain-cancer-patients-15200601.htm>.

V. DEFENDANTS' MANIPULATIVE SPOOFING SCHEME

A. Spoofing is a Form of Market Manipulation

53. There are three well-established economic assumptions that animate securities markets: (i) all else being equal, increased supply decreases prices and increased demand increases prices; (ii) a security's share price accurately reflects the security's value at that point in time based on the public information available to the market; and (iii) the quotes and orders published in the market reflect legitimate trading interest.

54. Spoofing is an insidious form of market manipulation that undermines the integrity and stability of securities markets by taking advantage of these three economic assumptions to artificially and illegally move the market price of a security either upwards or downwards.

55. Specifically, a market participant, often utilizing high-frequency trading computer systems that operate algorithmic trading programs to maximize the speed of their market access and the execution of their trading strategies, creates a false illusion of excess supply or demand by placing Baiting Orders, either into a Limit Order Book if one exists, or into an IDQS, that are not intended to be executed and have no legitimate economic purpose. These Baiting Orders are entered into the Limit Order Book and/or IDQS to create an illusion of market interest intended to generate a response from other market participants to follow the artificial selling or buying trend that the Baiting Orders created.

56. A legitimate trader buys when it thinks the price of a security is likely to go higher and sells when it thinks the price of a security will go lower. One of the tell-tale signs of a manipulative spoofer is a rapid reversal of trading direction – a lot of sell orders, followed by buy orders, followed by the cancellation of sell orders – which suggests that the original sell orders were not intended to be executed, but were merely a ploy to drive the price down to “buy low.”

Defendants engaged in this distinctive manipulative spoofing pattern again and again during the Relevant Period.

57. Thus, if the spoofer's goal is to drive the price down, the spoofer enters Baiting Orders to sell, which are intended to "bait" or "trick" investors into entering their own sell orders to minimize or avoid suffering losses in a downward trending market. Shortly after the spoofer places the Baiting Orders to sell, and after those Baiting Orders have lured unsuspecting traders into placing their own orders, the spoofer places orders to buy, or "Executing Purchases," on the opposite side of the Limit Order Book or IDQS. These Executing Purchases to buy are intended to be executed at the artificially low prices generated by the Baiting Orders to sell. Immediately after executing the Executing Purchases to buy in the Limit Order Book or IDQS, the spoofer cancels all of the Baiting Orders to sell, which completes the spoofing cycle.

58. In short, manipulative spoofing can be seen as high-speed bluffing, in which the spoofer deceives unsuspecting traders into transacting at artificially high or low prices. For example, a spoofer could place Baiting Orders to sell a big block of shares at \$10, when the last sale was at \$10.03. After other sellers rush to match the lower price, the spoofer would quickly pivot, cancel their sell order, and then place Executing Purchases at the \$10 price they generated with the Baiting Order. This scheme can be used multiple times during a trading day, and then repeated throughout a protracted trading period, as it was here.

59. In the SEC's "Staff Report on Algorithmic Trading in U.S. Capital Markets," dated August 5, 2020, the SEC discussed spoofing, describing it as "the submission and cancellation of buy and sell orders without the intention to trade in order to manipulate other traders" and calling it a "harmful strategy" employed by some high-frequency traders. The SEC further stated that spoofing was carried out by "strategically plac[ing] spoofing orders to create the impression of

substantial order book imbalances in order to manipulate subsequent prices,” and noted that “stocks targeted for spoofing had higher return volatility, lower market capitalization, lower price level, and lower managerial transparency.”

60. The persistence of the price impact of manipulation is well-established in the market microstructure literature. As Nobel prize-winning economist Professor Paul Milgrom has explained: “Because manipulative trades are viewed by market participants as potentially informed, and potentially informed trades can result in permanent price impact, *manipulative trades can lead to permanent price impact.*”⁹ Based on an extensive review of the literature, Dr. Milgrom gives two reasons for why market participants cannot readily identify manipulative trades: *First*, it is highly improbable that manipulative trades can immediately be identified as manipulative and uninformed by market participants. For any agent in the market, the incentive to gather private information – and thus to become an informed trader – is directly related to the volume of its trades and the size of its positions. The Defendants here are among the largest market participants and have powerful incentives to be well-informed. Other participants would likely expect this, and therefore have good reason to treat their trades as potentially informed. This tendency of large traders to be well informed is also observed by others in the market microstructure literature. *Second*, it is also improbable that the public will eventually come to know which trades were manipulative and uninformed. For all these reasons and others, Professor Milgrom concluded, “The market microstructure literature demonstrates clearly how potentially informed trades can result in permanent price impact.”

⁹ Expert Report of Professor Paul Milgrom at ¶21, *Alaska Electrical Pension Fund v. Bank of America*, Case No. 14-cv-7126 (JMF) (S.D.N.Y.) (Jan. 22, 2018).

B. Defendants Engaged in Manipulative Spoofing of NWBO

61. Trading records detailed in Exhibit 1 hereto, demonstrate that Defendants engaged in thousands of spoofing episodes and placed tens of millions of Baiting Orders to sell NWBO shares during the Relevant Period.¹⁰ The spoofing scheme perpetrated by the Defendants was intended to, and did, drive NWBO's market price downward so that Defendants could purchase NWBO shares at artificially lower prices. This scheme was accomplished through the following three stages:

62. First, Defendants flooded the markets with large quantities of Baiting Orders to sell during the "Baiting Period." These orders had no legitimate purpose and when placed, were not intended to be executed. The sole purpose for the placement of these Baiting Orders to sell was to deceive and mislead market participants into believing that the market price of NWBO's securities was moving downward.

63. Second, shortly after the Baiting Orders to sell were placed in the Limit Order Book or IDQS, Defendants placed their Executing Purchases on the opposite side of the Limit Order Book or IDQS to purchase NWBO shares at the lower stock prices created by the downward manipulation of their Baiting Orders to sell

64. Finally, immediately after the completion of their Executing Purchases to buy NWBO shares at the lower prices, Defendants cancelled and removed all of their Baiting Orders to sell from the Limit Order Book or IDQS.¹¹

¹⁰ The data utilized by Plaintiff to support the allegations in this Complaint consist of the complete stream of order book messages on NYSE ARCA Global OTC, including cancellations and executions, provided directly by NYSE Data Services, as well as the complete stream of historical Level II quotes and executed trades reported to FINRA, provided directly by OTC Markets Group.

¹¹ The terms "cancel" or "cancellation" in this Complaint refer to the deletion of an order from a

65. As Exhibit 1 details, this pattern was repeated by the Defendants multiple times a day and continuously throughout the Relevant Period. Defendants engaged in this distinctive spoofing pattern, each individually a “Spoofing Episode,” again and again, many multiple times a day and continuously throughout the Relevant Period – and at multiples of the average trader – resulting in large profits. Specifically, during the Relevant Period, Defendants collectively submitted 30,464,591 shares of fictitious Baiting Orders on OTC Link LLC and NYSE ARCA Global OTC.

66. As they intended, Defendants’ Baiting Orders led to a substantial sell-side imbalance in Defendants’ order flow at the time of Executing Purchases, successfully creating artificial selling pressure in the market and inducing other unknowing market participants to submit additional sell orders and artificially drive down the price of NWBO shares.

67. As reflected in Exhibit 1, Defendants then took advantage of the artificially depressed price of NWBO shares they created by placing Executing Purchases to purchase a total of 19,300,908 shares below the prevailing best offer prior to entry of the Baiting Orders, pocketing the difference. Almost immediately thereafter, Defendants then cancelled all of their fictitious Baiting Orders.

68. The following table lists by Defendant the share volume of Baiting Orders which were subsequently cancelled, the share volume of just one of the Executing Purchases which were executed at depressed prices per Spoofing Episode,¹² and the resulting price decline in NWBO

Limit Order Book, as well as a modification of an order or quote on a Limit Order Book or IDQS which results in reduction in the volume of shares displayed in that order or quote.

¹² This table, the examples that follow and Exhibit 1 only include and discuss one Executing Purchase per Spoofing Episode, but Defendants often purchased multiple times at artificially depressed prices per Spoofing Episode.

shares over the Relevant Period:

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
CANACCORD GENUITY LLC	135	3,329,826	478,988	-4.8244%
CITADEL SECURITIES LLC	671	11,598,613	3,274,511	-3.3561%
G1 EXECUTION SERVICES, LLC	161	2,687,551	760,365	-4.5192%
GTS SECURITIES LLC	154	2,722,466	660,556	-5.6843%
INSTINET, LLC	1,142	5,111,436	784,241	-1.8015%
LIME TRADING CORP.	408	2,050,000	1,000,153	-1.911%
VIRTU AMERICAS LLC	178	2,614,141	532,611	-4.4977%

69. Notably, as detailed in Exhibit 1, during Spoofing Episodes, Defendants submitted significantly more sell-side share orders per each Executing Purchase than for non-spoofed executed purchases. During the Baiting Period for each Spoofing Episode, Defendants submitted new sell-side orders for an average of 17,170 shares per Executing Purchase. During the same time window prior to non-spoofed executed purchases, market participants submitted new sell-side orders for an average of 1,879 shares per purchase. In other words, Defendants' ratio of sell-side orders per executing purchase was more than **9 times** that of non-spoofed executed purchases during Spoofing Episodes.

70. Similarly, as detailed in Exhibit 1, during Spoofing Episodes, Defendants cancelled significantly more sell-side orders than after non-spoofed executed purchases. During the Cancellation Period following the Executing Purchases, Defendants cancelled an average of 16,681 shares in sell-side orders, or 97.15% of the average created volume of 17,170 sell-side shares by Defendants. During the same time window as the Cancellation Period following non-spoofed executed purchases, market participants cancelled an average of 767 shares in sell-side

orders, or 40.82% of the average created volume of 1,879 sell-side shares. That is, on average, there were 2,074% or ***more than 20 times*** more sell-side shares cancelled in the Cancellation Period following Executing Purchases compared to non-spoofed executed purchases.

71. In other words, when spoofing the market, Defendants injected exponentially more artificial sell-side order flow prior to buying shares, as measured by: (1) the volume of sell side order flow (814% higher); (2) the cancellation of that order flow (2,074% higher); and (3) the greater share of cancelled sell-side order flow (97.15% vs. 40.82%).

72. The placement and cancellation of Baiting Orders to sell by Defendants throughout the Relevant Period operated as a manipulative fraud on the market. The Baiting Orders were intended to mislead other market participants into believing that the downward movement of NWBO's share price was being caused by the natural forces of supply and demand. The placement and cancellation of thousands of Baiting Orders to Defendants was not in furtherance of any legitimate purpose. Rather, this activity was intended to send a false and misleading pricing signal to the market to trick or bait market participants into executing their own sell orders. This created a "pile-on" effect which drove down NWBO's share price even further, thereby enabling Defendants to purchase NWBO's shares at artificially manipulated lower prices.

73. One example of Defendants' manipulative spoofing activity in NWBO's shares occurred on May 10, 2022. On that day, the market learned excellent news about NWBO: its key drug had met both its primary and secondary endpoints in its GBM clinical trial with statistical significance under the Statistical Analysis Plan, displayed an excellent safety profile, and showed meaningful increases in the long-term tails of the survival curves for both newly diagnosed GBM and recurrent GBM patients – excellent news that should have caused NWBO's share price to

increase, absent manipulation in the market.¹³ However, Defendants spoofed the market for NWBO shares on both OTC Link LLC and NYSE ARCA Global OTC that day, driving down the price of NWBO shares from a high of \$1.73 to a low of \$0.3862. This ***decline of 78%*** in the price on a day ***with positive news about the Company*** was caused, at least in part, by Defendants' relentless and brazen manipulation of the market for NWBO shares.

74. Specifically, on May 10, 2022, Defendants submitted fictitious Baiting Orders to OTC Link LLC and NYSE ARCA Global OTC totaling **2,883,387** shares at share prices ranging from \$1.68 to \$0.40. As intended, the Baiting Orders successfully induced the entry of sell orders from other market participants, and Defendants subsequently purchased a total of 509,062 shares at these depressed prices, which were always below the prevailing best offer prior to entry of the Baiting Orders. Shortly thereafter, Defendants cancelled the fictitious Baiting Orders. After each set of these Baiting Orders, the price of NWBO shares declined, on average, by -11.77%.

75. The following are additional examples of specific spoofing activities by each Defendant during the Relevant Period. These examples are based on detailed trading records that reflect the interplay between the Baiting and Executing Purchases and how each Defendant manipulated downward the market price of NWBO shares on OTC Link LLC and NYSE ARCA Global OTC.¹⁴ Defendants' relentless and repetitive spoofing activities throughout the Relevant

¹³ There was at least one news article that appeared that day which, for reasons unknown at this time, put a negative spin on the trial results, but as all credible sources have since confirmed, the results themselves were positive and highly encouraging.

¹⁴ While quotes and orders on OTC Link LLC and Global OTC are displayed to market participants, there are two kinds of data which are not publicly visible. ***First***, some orders were placed on OTC Link ECN, an anonymous electronic communications network. The lack of attributed orders on OTC Link ECN means that discovery will be necessary to identify Spoofing Episodes on that platform, but has no effect on the Spoofing Episodes identified in this Complaint. ***Second***, while executions on Global OTC are attributable to market participants, other OTC

Period caused a sustained decline in the market price of NWBO shares from which it did not recover during the Relevant Period. Exhibit 1 to this Complaint contains a list of Spoofing Episodes by each Defendant, along with the volume and prices of Baiting Orders, Executing Purchases and the price impact of each Spoofing Episode, during the Relevant Period.

1. October 12, 2020

76. As the following chart details, on October 12, 2020, Defendants submitted 472,291 shares of fictitious Baiting Orders at share prices ranging from \$1.88 to \$0.905 on OTC Link LLC and NYSE ARCA Global OTC. Defendants never intended for these Baiting Orders to be filled, but instead, planned to cancel them before placing the orders. The Baiting Orders successfully induced the entry of sell orders from other market participants, artificially driving down the price of NWBO shares by -3.108% on average. Defendants then rapidly reversed course and purchased a total of 110,352 shares below the prevailing best offer prior to entry of the Baiting Orders.¹⁵ Shortly thereafter, Defendants cancelled all of the fictitious Baiting Orders.

77. For each Defendant, the following table lists the share volume of Baiting Orders which were subsequently cancelled, share volume of one of the Executing Purchases per Spoofing Episode which were executed at depressed prices, and the resulting price decline in NWBO shares on October 12, 2020:

executions are not. To identify Executing Purchases on Global OTC, Plaintiff uses order execution messages publicly displayed on that platform. To identify other Executing Purchases, Plaintiff matched anonymized transactions from FINRA to changes in displayed OTC Link LLC quotes: if a transaction is followed by a change in a market participant's bid within five seconds that is equal in volume and price to that of the transaction, the Executing Purchase is attributed to that market participant.

¹⁵ See footnote 4 above.

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
CANACCORD GENUITY LLC	2	5,770	5,100	-2.322%
CITADEL SECURITIES LLC	19	355,179	82,245	-3.241%
GTS SECURITIES LLC	6	106,164	22,279	-2.859%
VIRTU AMERICAS LLC	1	5,178	728	-3.636%

78. During the Baiting Period for each Spoofing Episode that day, Defendants submitted new sell-side orders for an average of 22,583 shares per Executing Purchase. During the same time window prior to non-spoofed executed purchases that day, market participants submitted new sell-side orders for an average of 6,006 shares per purchase.

79. During the Cancellation Period following the Executing Purchases, Defendants cancelled an average of 24,537 shares in sell-side orders, or 108.7% of the created volume of 22,583 sell-side shares. During the same time window as the Cancellation Period following non-spoofed executed purchases, market participants cancelled an average of 1,093 shares in sell-side orders, or 18.2% of the created volume of 6,006 sell-side shares.

80. On average, therefore, there were 276% more sell-side shares created in the Baiting Period prior to Executing Purchases compared to non-spoofed executed purchases, and 2,144% more sell-side shares cancelled in the Cancellation Period following Executing Purchases compared to non-spoofed executed purchases.

81. Defendants thus injected more artificial sell-side order flow than non-spoofed orders prior to buying shares, as measured by (1) the volume of sell side order flow (276% higher); (2) the cancellation of that order flow (2,144% higher); and (3) the greater share of cancelled sell-side order flow (108.7% vs. 18.2%).

82. This behavior is inconsistent with *bona fide* market making, which involves purchases and sales in roughly comparable amounts to provide liquidity to customers or other

broker-dealers while remaining roughly market neutral. Over Baiting Periods, Defendants posted a median of 106% more new sell-side orders than new buy-side orders. Over Cancellation Periods, Defendants cancelled a median of 97% of the sell-side orders created during Baiting Periods, but only a median of 61% of the buy-side orders created during Baiting Periods. This asymmetry in order cancellation rates is thus inconsistent with *bona fide* market making.

a) CITADEL SECURITIES LLC

(1) Example Episode: October 12, 2020 – 14:20:25

83. On October 12, 2020 at 14:20:25, the best bid and offer for NWBO as calculated by Plaintiff was a bid to purchase 5,000 shares at a price of \$1.02 per share and an offer to sell 5,100 shares at a price of \$1.04 per share.¹⁶

84. From 14:18:25 to 14:20:25, Defendant CITADEL SECURITIES LLC placed 10,850 shares of Baiting Orders at prices ranging from \$1.05 to \$1.03 per share.¹⁷ As of 14:20:25

¹⁶ The best bid and offer are calculated based on actual orders and executions using data available from OTC Link. The contemporaneous “inside quote” on OTC Link, which reflects the quote with the best bid and offer according to OTC Link’s calculation, as of 14:20:24.267, was a bid to purchase 10,000 shares at a price of \$1.02 per share and an offer to sell 5,300 shares at a price of \$1.04 per share. Plaintiff has identified several instances where the “inside quote” appears to be out of date, and therefore inaccurate, which is why this Complaint calculates the best bid and offer directly. Regardless, the vast majority of “inside quotes” on OTC Link are the same as the calculated best offer identified on Exhibit 1 (identical up to two decimal places 84% of the time). And, even if the OTC Link “inside quotes” were used instead of the calculated best offers to conduct the analyses herein, 99.4% of the identified transactions would still meet the criteria for a Spoofing Episode.

¹⁷ The volume of Baiting Orders for a Spoofing Episode is the lesser of the volume of sell-side orders cancelled in the two minutes after the Executing Purchase and the volume of sell-side orders created in the two minutes prior to the Executing Purchase (*i.e.*, the sell-side orders cancelled within two minutes after the Executing Purchase whose aggregate volume was created within the two minutes prior to the Executing Purchase). The market impact of a Baiting Order is the same regardless of whether a Defendant cancelled that specific Baiting Order or an equivalent order previously placed by that Defendant on the over-the-counter markets. For this reason, whenever *prices* for Baiting Orders are stated in this Complaint, those prices reflect the prices of orders

the submission of these Baiting Orders left Defendant CITADEL SECURITIES LLC with an imbalanced order book position favoring the sell side consisting of bids to purchase 5,000 shares at a price of \$1.02 per share, and an offer to sell 7,250 shares at a price of \$1.05 per share.

85. Between 14:20:25 and 14:22:25, based on publicly available data accessible to Plaintiff, Defendant CITADEL SECURITIES LLC did not sell any shares of NWBO, which is consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant CITADEL SECURITIES LLC must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant CITADEL SECURITIES LLC sold some NWBO shares during this episode, such sales would be consistent with Defendant CITADEL SECURITIES LLC's conversion of spoofing profits into cash.

86. Defendant CITADEL SECURITIES LLC parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders, THE VERTICAL TRADING GROUP, LLC had placed orders to sell 100 shares at prices as low as \$1.04, a better price than some or all of the Baiting Orders placed by Defendant CITADEL SECURITIES LLC. Parking its Baiting Orders behind orders by other market participants like THE VERTICAL TRADING GROUP, LLC is further evidence that Defendant CITADEL SECURITIES LLC was not engaging in legitimate market activity.¹⁸ Only 5% of the non-spoofed executed purchases that day had the purchaser previously park sell-side orders behind other market

cancelled after an Executing Purchase.

¹⁸ The market impact of a "parked" Baiting Order is the same regardless of whether it was first placed after the better offer or was placed earlier and maintained behind the better offer. Defendants' decision to place or maintain offers in the Limit Order Book or IDQS that are away from the market is indicative of their desire to exert downward pressure on the stock price, while making it highly unlikely that their offers will execute.

participants.

87. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 14:20:25, Defendant CITADEL SECURITIES LLC took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 100 shares, at a price of \$1.02 per share, which was below the prevailing best offer of \$1.04 per share.¹⁹

88. Defendant CITADEL SECURITIES LLC began to cancel these Baiting Orders within 2.514 seconds. By 14:22:25, Defendant CITADEL SECURITIES LLC had cancelled all of its Baiting Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant CITADEL SECURITIES LLC. After cancelling the Baiting Orders, Defendant CITADEL SECURITIES LLC had an order book position on the over-the-counter markets consisting of bids to purchase 9,600 shares at a price of \$1.03 per share and offers to sell 1,000 shares at a price of \$1.04 per share – dramatically reversing the position it had taken only moments before.

89. Defendant CITADEL SECURITIES LLC sold shares of NWBO both before and after this Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash regardless of whether the Executing Purchases established a long position in NWBO or were used to close out a previously established short position. Specifically, Defendant CITADEL SECURITIES LLC sold 8,700 shares at a price of \$1.05 per share at 14:32:35, after the Spoofing Episode, which generated a return of 2.941% on its Executing Purchases at the artificially depressed price of \$1.02 per share. Defendant CITADEL SECURITIES LLC also sold 46,690

¹⁹ See footnote 4 above.

shares at a price of \$1.03 per share at 14:09:18, prior to the Spoofing Episode, which generated a return of 0.9804% if that sale created a short position that was closed out by the Executing Purchases at the artificially depressed price of \$1.02 per share.

2. October 15, 2020

90. As the following chart details, on October 15, 2020, Defendants submitted 714,584 shares of fictitious Baiting Orders at share prices ranging from \$2.40 to \$1.16 on OTC Link LLC and NYSE ARCA Global OTC. Defendants never intended for these Baiting Orders to be filled, but instead, planned to cancel them before placing the orders. The Baiting Orders successfully induced the entry of sell orders from other market participants, artificially driving down the price of NWBO shares by -3.96% on average. Defendants then rapidly reversed course and purchased a more than 121,035 shares below the prevailing best offer prior to entry of the Baiting Orders.²⁰ Shortly thereafter, Defendants cancelled all of the fictitious Baiting Orders.

91. For each Defendant, the following table lists the share volume of Baiting Orders which were subsequently cancelled, share volume of one of the Executing Purchases per Spoofing Episode which were executed at depressed prices, and the resulting price decline in NWBO shares on October 15, 2020:

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
CANACCORD GENUITY LLC	8	137,916	11,900	-4.677%
CITADEL SECURITIES LLC	29	397,520	85,153	-3.659%
G1 EXECUTION SERVICES, LLC	3	17,465	3,500	-5.447%
GTS SECURITIES LLC	5	40,773	2,751	-3.265%
VIRTU AMERICAS LLC	8	120,910	17,731	-4.214%

92. During the Baiting Period for each Spoofing Episode that day, Defendants

²⁰ See footnote 4 above.

submitted new sell-side orders for an average of 27,949 shares per Executing Purchase. During the same time window prior to non-spoofed executed purchases that day, market participants submitted new sell-side orders for an average of 10,486 shares per purchase.

93. During the Cancellation Period following the Executing Purchases, Defendants cancelled an average of 20,103 shares in sell-side orders, or 71.93% of the created volume of 27,949 sell-side shares. During the same time window as the Cancellation Period following non-spoofed executed purchases, market participants cancelled an average of 3,305 shares in sell-side orders, or 31.52% of the created volume of 10,486 sell-side shares.

94. On average, therefore, there were 167% more sell-side shares created in the Baiting Period prior to Executing Purchases compared to non-spoofed executed purchases, and 508% more sell-side shares cancelled in the Cancellation Period following Executing Purchases compared to non-spoofed executed purchases.

95. Defendants thus injected more artificial sell-side order flow than non-spoofed orders prior to buying shares, as measured by (1) the volume of sell side order flow (167% higher); (2) the cancellation of that order flow (508% higher); and (3) the greater share of cancelled sell-side order flow (71.93% vs. 31.52%).

96. This behavior is inconsistent with *bona fide* market making, which involves purchases and sales in roughly comparable amounts to provide liquidity to customers or other broker-dealers while remaining roughly market neutral. Over Baiting Periods, Defendants posted a median of 114% more new sell-side orders than new buy-side orders. Over Cancellation Periods, Defendants cancelled a median of 67% of the sell-side orders created during Baiting Periods, but only a median of 40% of the buy-side orders created during Baiting Periods. This asymmetry in order cancellation rates is thus inconsistent with *bona fide* market making.

a) *CANACCORD GENUITY LLC*

(1) Example Episode: October 15, 2020 – 09:30:17

97. On October 15, 2020 at 09:30:17, the best bid and offer for NWBO as calculated by Plaintiff was a bid to purchase 20,000 shares at a price of \$1.20 per share and an offer to sell 100 shares at a price of \$1.21 per share.²¹

98. From 09:28:17 to 09:30:17, Defendant CANACCORD GENUITY LLC placed 29,400 shares of Baiting Orders at prices ranging from \$2.40 to \$1.18 per share. As of 09:30:17 the submission of these Baiting Orders left Defendant CANACCORD GENUITY LLC with an imbalanced order book position favoring the sell side consisting of bids to purchase 2,900 shares at prices ranging from \$0.21 per share to \$1.20 per share, and an offer to sell 10,500 shares at a price of \$1.25 per share.

99. Between 09:30:17 and 09:32:17, based on publicly available data accessible to Plaintiff, Defendant CANACCORD GENUITY LLC did not sell any shares of NWBO, which is consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant CANACCORD GENUITY LLC must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant CANACCORD GENUITY LLC sold some NWBO shares during this episode, such sales would be consistent with Defendant CANACCORD GENUITY LLC's conversion of spoofing profits into cash.

100. Defendant CANACCORD GENUITY LLC parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders,

²¹ The contemporaneous "inside quote" on OTC Link as of 09:30:16.887 was identical: a bid to purchase 20,000 shares at a price of \$1.20 per share and an offer to sell 100 shares at a price of \$1.21 per share.

THE VERTICAL TRADING GROUP, LLC had placed orders to sell 100 shares at prices as low as \$1.30, a better price than some or all of the Baiting Orders placed by Defendant CANACCORD GENUITY LLC Parking its Baiting Orders behind orders by other market participants like THE VERTICAL TRADING GROUP, LLC is further evidence that Defendant CANACCORD GENUITY LLC was not engaging in legitimate market activity. Only 3% of the non-spoofed executed purchases that day had the purchaser previously park sell-side orders behind other market participants.

101. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 09:30:17, Defendant CANACCORD GENUITY LLC took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 100 shares, at a price of \$1.20 per share, which was below the prevailing best offer of \$1.21 per share.²²

102. Defendant CANACCORD GENUITY LLC began to cancel these Baiting Orders within 198 milliseconds of its Executing Purchases. By 09:32:17, Defendant CANACCORD GENUITY LLC had cancelled all of its Baiting Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant CANACCORD GENUITY LLC. After cancelling the Baiting Orders, Defendant CANACCORD GENUITY LLC had an order book position on the over-the-counter markets consisting of bids to purchase 11,100 shares at a price of \$1.15 per share and offers to sell 4,900 shares at a price of \$1.18 per share – dramatically reversing the position it had taken only moments before.

103. Defendant CANACCORD GENUITY LLC sold shares of NWBO after this

²² See footnote 4 above.

Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash if the Executing Purchases established a long position in NWBO. Specifically, Defendant CANACCORD GENUITY LLC sold 25,500 shares at a price of \$1.27 per share at 09:41:13, after the Spoofing Episode, which generated a return of 5.833% on its Executing Purchases at the artificially depressed price of \$1.20 per share.

3. October 20, 2020

104. As the following chart details, on October 20, 2020, Defendants submitted 851,990 shares of fictitious Baiting Orders at share prices ranging from \$5.00 to \$2.05 on OTC Link LLC and NYSE ARCA Global OTC. Defendants never intended for these Baiting Orders to be filled, but instead, planned to cancel them before placing the orders. The Baiting Orders successfully induced the entry of sell orders from other market participants, artificially driving down the price of NWBO shares by -3.244% on average. Defendants then rapidly reversed course and purchased a total of 200,743 shares below the prevailing best offer prior to entry of the Baiting Orders.²³ Shortly thereafter, Defendants cancelled all of the fictitious Baiting Orders.

105. For each Defendant, the following table lists the share volume of Baiting Orders which were subsequently cancelled, share volume of one of the Executing Purchases per Spoofing Episode which were executed at depressed prices, and the resulting price decline in NWBO shares on October 20, 2020:

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
CANACCORD GENUITY LLC	5	215,747	12,459	-3.73%
CITADEL SECURITIES LLC	36	330,171	122,419	-3.157%
G1 EXECUTION SERVICES, LLC	12	174,264	50,837	-3.253%
GTS SECURITIES LLC	2	21,450	1,830	-1.778%
INSTINET, LLC	5	31,746	3,900	-5.879%

²³ See footnote 4 above.

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
VIRTU AMERICAS LLC	8	78,612	9,298	-2.037%

106. During the Baiting Period for each Spoofing Episode that day, Defendants submitted new sell-side orders for an average of 18,862 shares per Executing Purchase. During the same time window prior to non-spoofed executed purchases that day, market participants submitted new sell-side orders for an average of 7,903 shares per purchase.

107. During the Cancellation Period following the Executing Purchases, Defendants cancelled an average of 17,602 shares in sell-side orders, or 93.32% of the created volume of 18,862 sell-side shares. During the same time window as the Cancellation Period following non-spoofed executed purchases, market participants cancelled an average of 3,261 shares in sell-side orders, or 41.26% of the created volume of 7,903 sell-side shares.

108. On average, therefore, there were 139% more sell-side shares created in the Baiting Period prior to Executing Purchases compared to non-spoofed executed purchases, and 440% more sell-side shares cancelled in the Cancellation Period following Executing Purchases compared to non-spoofed executed purchases.

109. Defendants thus injected more artificial sell-side order flow than non-spoofed orders prior to buying shares, as measured by (1) the volume of sell side order flow (139% higher); (2) the cancellation of that order flow (440% higher); and (3) the greater share of cancelled sell-side order flow (93.32% vs. 41.26%).

110. This behavior is inconsistent with *bona fide* market making, which involves purchases and sales in roughly comparable amounts to provide liquidity to customers or other broker-dealers while remaining roughly market neutral. Over Cancellation Periods, Defendants cancelled a median of 97% of the sell-side orders created during Baiting Periods, but only a median

of 72% of the buy-side orders created during Baiting Periods. This asymmetry in order cancellation rates is thus inconsistent with *bona fide* market making.

a) *INSTINET, LLC*

(1) Example Episode: October 20, 2020 - 11:39:44

111. On October 20, 2020 at 11:39:44, the best bid and offer for NWBO as calculated by Plaintiff was a bid to purchase 1,035 shares at a price of \$2.24 per share and an offer to sell 300 shares at a price of \$2.25 per share.²⁴

112. From 11:37:44 to 11:39:44, Defendant INSTINET, LLC placed 5,323 shares of Baiting Orders at prices ranging from \$2.25 to \$2.19 per share. As of 11:39:44, the submission of these Baiting Orders left Defendant INSTINET, LLC with an imbalanced order book position favoring the sell side consisting of bids to purchase 100 shares at a price of \$2.23 per share, and an offer to sell 1,000 shares at prices ranging from \$2.25 per share to \$2.50 per share.

113. Between 11:39:44 and 11:41:44, based on publicly available data accessible to Plaintiff, Defendant INSTINET, LLC did not sell any shares of NWBO, which is consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant INSTINET, LLC must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant INSTINET, LLC sold some NWBO shares during this episode, such sales would be consistent with Defendant INSTINET, LLC's conversion of spoofing profits into cash.

114. Defendant INSTINET, LLC parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders, JEFFERIES LLC

²⁴ The contemporaneous "inside quote" on OTC Link as of 11:39:43.797 was identical in price: a bid to purchase 1,035 shares at a price of \$2.24 per share and an offer to sell 21,100 shares at a price of \$2.25 per share.

had placed orders to sell 300 shares at prices as low as \$2.24, a better price than some or all of the Baiting Orders placed by Defendant INSTINET, LLC. Parking its Baiting Orders behind orders by other market participants like JEFFERIES LLC is further evidence that Defendant INSTINET, LLC was not engaging in legitimate market activity. Only 11% of the non-spoofed executed purchases that day had the purchaser previously park sell-side orders behind other market participants.

115. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 11:39:44, Defendant INSTINET, LLC took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 100 shares, at a price of \$2.23 per share, which was below the prevailing best offer of \$2.24 per share.²⁵

116. Defendant INSTINET, LLC began to cancel these Baiting Orders within 3.342 seconds. By 11:41:44, Defendant INSTINET, LLC, had cancelled all of its Baiting Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant INSTINET, LLC. After cancelling the Baiting Orders, Defendant INSTINET, LLC had an order book position on the over-the-counter markets consisting of no bids and offers to sell 500 shares at a price of \$2.50 per share – dramatically reversing the position it had taken only moments before.

117. Defendant INSTINET, LLC sold shares of NWBO both before and after this Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash regardless of whether the Executing Purchases established a long position in NWBO or were used to close out a previously established short position. Specifically, Defendant INSTINET, LLC sold 1,100

²⁵ See footnote 4 above.

shares at a price of \$2.27 per share at 12:21:48, after the Spoofing Episode, which generated a return of 1.794% on its Executing Purchases at the artificially depressed price of \$2.23 per share. Defendant INSTINET, LLC also sold 500 shares at a price of \$2.27 per share at 11:39:02, prior to the Spoofing Episode, which generated a return of 1.794% if that sale created a short position that was closed out by the Executing Purchases at the artificially depressed price of \$2.23 per share.

4. October 27, 2020

118. As the following chart details, on October 27, 2020, Defendants submitted 2,962,168 shares of fictitious Baiting Orders at share prices ranging from \$2.72 to \$0.98 on OTC Link LLC and NYSE ARCA Global OTC. Defendants never intended for these Baiting Orders to be filled, but instead, planned to cancel them before placing the orders. The Baiting Orders successfully induced the entry of sell orders from other market participants, artificially driving down the price of NWBO shares by -6.45% on average. Defendants then rapidly reversed course and purchased a total of 298,075 shares below the prevailing best offer prior to entry of the Baiting Orders.²⁶ Shortly thereafter, Defendants cancelled all of the fictitious Baiting Orders.

119. For each Defendant, the following table lists the share volume of Baiting Orders which were subsequently cancelled, share volume of one of the Executing Purchases per Spoofing Episode which were executed at depressed prices, and the resulting price decline in NWBO shares on October 27, 2020:

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
CANACCORD GENUITY LLC	12	807,744	15,315	-7.251%
CITADEL SECURITIES LLC	22	1,077,312	172,766	-6.632%
G1 EXECUTION SERVICES, LLC	16	485,125	54,838	-6.575%
GTS SECURITIES LLC	12	330,389	28,334	-6.821%
INSTINET, LLC	9	59,488	9,700	-2.71%

²⁶ See footnote 4 above.

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
VIRTU AMERICAS LLC	14	202,110	17,122	-7.422%

120. During the Baiting Period for each Spoofing Episode that day, Defendants submitted new sell-side orders for an average of 54,271 shares per Executing Purchase. During the same time window prior to non-spoofed executed purchases that day, market participants submitted new sell-side orders for an average of 14,073 shares per purchase.

121. During the Cancellation Period following the Executing Purchases, Defendants cancelled an average of 63,624 shares in sell-side orders, or 117.2% of the created volume of 54,271 sell-side shares. During the same time window as the Cancellation Period following non-spoofed executed purchases, market participants cancelled an average of 10,286 shares in sell-side orders, or 73.09% of the created volume of 14,073 sell-side shares.

122. On average, therefore, there were 286% more sell-side shares created in the Baiting Period prior to Executing Purchases compared to non-spoofed executed purchases, and 519% more sell-side shares cancelled in the Cancellation Period following Executing Purchases compared to non-spoofed executed purchases.

123. Defendants thus injected more artificial sell-side order flow than non-spoofed orders prior to buying shares, as measured by (1) the volume of sell side order flow (286% higher); (2) the cancellation of that order flow (519% higher); and (3) the greater share of cancelled sell-side order flow (117.2% vs. 73.09%).

124. This behavior is inconsistent with *bona fide* market making, which involve purchases and sales in roughly comparable amounts to provide liquidity to customers or other broker-dealers while remaining roughly market neutral. Over Cancellation Periods, on average, Defendants cancelled 285% of the sell-side orders created during Baiting Periods, but only 94%

of the buy-side orders created during Baiting Periods. This asymmetry in order cancellation rates is thus inconsistent with *bona fide* market making.

a) *VIRTU AMERICAS LLC*

(1) Example Episode: October 27, 2020 – 10:27:42

125. On October 27, 2020 at 10:27:42, the best bid and offer for NWBO as calculated by Plaintiff was a bid to purchase 2,990 shares at a price of \$1.16 per share and an offer to sell 57,655 shares at a price of \$1.17 per share.²⁷

126. From 10:25:42 to 10:27:42, Defendant VIRTU AMERICAS LLC placed 1,400 shares of Baiting Orders at prices ranging from \$1.21 to \$1.17 per share. As of 10:27:42 the submission of these Baiting Orders left Defendant VIRTU AMERICAS LLC with an imbalanced order book position favoring the sell side consisting of bids to purchase 1,000 shares at a price of \$1.16 per share, and an offer to sell 1,500 shares at a price of \$1.21 per share.

127. Between 10:27:42 and 10:29:42, based on publicly available data accessible to Plaintiff, Defendant VIRTU AMERICAS LLC did not sell any shares of NWBO, which is consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant VIRTU AMERICAS LLC must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant VIRTU AMERICAS LLC sold some NWBO shares during this episode, such sales would be consistent with Defendant VIRTU AMERICAS LLC's conversion of spoofing profits into cash.

128. Defendant VIRTU AMERICAS LLC parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders,

²⁷ The contemporaneous “inside quote” on OTC Link as of 10:27:41.747 was identical in price: a bid to purchase 3,990 shares at a price of \$1.16 per share and an offer to sell 57,655 shares at a price of \$1.17 per share.

ASCENDIANT CAPITAL MARKETS, LLC had placed orders to sell 100 shares at prices as low as \$1.18, a better price than some or all of the Baiting Orders placed by Defendant VIRTU AMERICAS LLC. Parking its Baiting Orders behind orders by other market participants like ASCENDIANT CAPITAL MARKETS, LLC is further evidence that Defendant VIRTU AMERICAS LLC was not engaging in legitimate market activity. Only 15% of the non-spoofed executed purchases that day had the purchaser previously park sell-side orders behind other market participants.

129. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 10:27:42, Defendant VIRTU AMERICAS LLC took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 100 shares, at a price of \$1.16 per share, which was below the prevailing best offer of \$1.17 per share.²⁸

130. Defendant VIRTU AMERICAS LLC began to cancel these Baiting Orders within 4.967 seconds. By 10:29:42, Defendant VIRTU AMERICAS LLC, had cancelled all of its Baiting Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant VIRTU AMERICAS LLC. After cancelling the Baiting Orders, Defendant VIRTU AMERICAS LLC had an order book position on the over-the-counter markets consisting of no bids and offers to sell 5,600 shares at a price of \$1.20 per share – dramatically reversing the position it had taken only moments before.

131. Defendant VIRTU AMERICAS LLC sold shares of NWBO both before and after this Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash regardless of whether the Executing Purchases established a long position in NWBO or were used

²⁸ See footnote 4 above.

to close out a previously established short position. Specifically, Defendant VIRTU AMERICAS LLC sold 500 shares at a price of \$1.17 per share at 10:30:23, after the Spoofing Episode, which generated a return of 0.8621% on its Executing Purchases at the artificially depressed price of \$1.16 per share. Defendant VIRTU AMERICAS LLC also sold 2,000 shares at a price of \$1.29 per share at 10:19:41, prior to the Spoofing Episode, which generated a return of 11.21% if that sale created a short position that was closed out by the Executing Purchases at the artificially depressed price of \$1.16 per share.

5. November 02, 2020

132. As the following chart details, on November 02, 2020, Defendants submitted 57,273 shares of fictitious Baiting Orders at share prices ranging from \$1.20 to \$1.05 on OTC Link LLC and NYSE ARCA Global OTC. Defendants never intended for these Baiting Orders to be filled, but instead, planned to cancel them before placing the orders. The Baiting Orders successfully induced the entry of sell orders from other market participants, artificially driving down the price of NWBO shares by -2.268% on average. Defendants then rapidly reversed course and purchased a total of 20,406 shares below the prevailing best offer prior to entry of the Baiting Orders.²⁹ Shortly thereafter, Defendants cancelled all of the fictitious Baiting Orders.

133. For each Defendant, the following table lists the share volume of Baiting Orders which were subsequently cancelled, share volume of one of the Executing Purchases per Spoofing Episode which were executed at depressed prices, and the resulting price decline in NWBO shares on November 02, 2020:

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
CITADEL SECURITIES LLC	2	19,877	10,806	-2.836%

²⁹ See footnote 4 above.

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
G1 EXECUTION SERVICES, LLC	3	31,556	9,100	-2.702%
INSTINET, LLC	2	5,840	500	-1.048%

134. During the Baiting Period for each Spoofing Episode that day, Defendants submitted new sell-side orders for an average of 19,993 shares per Executing Purchase. During the same time window prior to non-spoofed executed purchases that day, market participants submitted new sell-side orders for an average of 2,263 shares per purchase.

135. During the Cancellation Period following the Executing Purchases, Defendants cancelled an average of 11,814 shares in sell-side orders, or 59.09% of the created volume of 19,993 sell-side shares. During the same time window as the Cancellation Period following non-spoofed executed purchases, market participants cancelled an average of 781 shares in sell-side orders, or 34.49% of the created volume of 2,263 sell-side shares.

136. On average, therefore, there were 784% more sell-side shares created in the Baiting Period prior to Executing Purchases compared to non-spoofed executed purchases, and 1414% more sell-side shares cancelled in the Cancellation Period following Executing Purchases compared to non-spoofed executed purchases.

137. Defendants thus injected more artificial sell-side order flow than non-spoofed orders prior to buying shares, as measured by (1) the volume of sell side order flow (784% higher); (2) the cancellation of that order flow (1,414% higher); and (3) the greater share of cancelled sell-side order flow (59.09% vs. 34.49%).

138. This behavior is inconsistent with *bona fide* market making, which involves purchases and sales in roughly comparable amounts to provide liquidity to customers or other broker-dealers while remaining roughly market neutral. Over Baiting Periods, Defendants posted

a median of 314% more new sell-side orders than new buy-side orders. Over Cancellation Periods, Defendants cancelled a median of 93% of the sell-side orders created during Baiting Periods, but only a median of 32% of the buy-side orders created during Baiting Periods. This asymmetry in order cancellation rates is thus inconsistent with *bona fide* market making.

a) *G1 EXECUTION SERVICES, LLC*

(1) Example Episode: November 02, 2020 - 09:51:30

139. On November 02, 2020 at 09:51:30, the best bid and offer for NWBO as calculated by Plaintiff was a bid to purchase 1,171 shares at a price of \$1.12 per share and an offer to sell 21,700 shares at a price of \$1.14 per share.³⁰

140. From 09:49:30 to 09:51:30, Defendant G1 EXECUTION SERVICES, LLC placed 21,545 shares of Baiting Orders at a price of \$1.16 per share. As of 09:51:30 the submission of these Baiting Orders left defendant G1 EXECUTION SERVICES, LLC with an imbalanced order book position favoring the sell side consisting of bids to purchase 10,000 shares at a price of \$1.12 per share, and an offer to sell 28,445 shares at a price of \$1.14 per share.

141. Between 09:51:30 and 09:53:30, based on publicly available data accessible to Plaintiff, defendant G1 EXECUTION SERVICES, LLC did not sell any shares of NWBO, which is consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant G1 EXECUTION SERVICES, LLC must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant G1 EXECUTION SERVICES, LLC sold some NWBO shares during this episode, such sales would be consistent with Defendant G1 EXECUTION SERVICES, LLC's conversion of spoofing profits

³⁰ The contemporaneous "inside quote" on OTC Link as of 09:51:22.908 was identical in price: a bid to purchase 11,171 shares at a price of \$1.12 per share and an offer to sell 50,145 shares at a price of \$1.14 per share.

into cash.

142. Defendant G1 EXECUTION SERVICES, LLC parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders, PUMA CAPITAL, LLC had placed orders to sell 100 shares at prices as low as \$1.14, a better price than some or all of the Baiting Orders placed by Defendant G1 EXECUTION SERVICES, LLC. Parking its Baiting Orders behind orders by other market participants like PUMA CAPITAL, LLC is further evidence that Defendant G1 EXECUTION SERVICES, LLC was not engaging in legitimate market activity. Only 3% of the non-spoofed executed purchases that day had the purchaser previously park sell-side orders behind other market participants.

143. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 09:51:30, Defendant G1 EXECUTION SERVICES, LLC took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 6,000 shares, at a price of \$1.12 per share, which was below the prevailing best offer of \$1.14 per share.³¹

144. Defendant G1 EXECUTION SERVICES, LLC began to cancel these Baiting Orders within 3.299 seconds. By 09:53:30, Defendant G1 EXECUTION SERVICES, LLC had cancelled all of its Baiting Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant G1 EXECUTION SERVICES, LLC. After cancelling the Baiting Orders, Defendant G1 EXECUTION SERVICES, LLC had an order book position on the over-the-counter markets consisting of bids to purchase 6,000 shares at a price of \$1.12 per share and offers to sell 1,100 shares at a price of \$1.16 per share—dramatically

³¹ See footnote 4 above.

reversing the position it had taken only moments before.

145. Defendant G1 EXECUTION SERVICES, LLC sold shares of NWBO both before and after this Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash regardless of whether the Executing Purchases established a long position in NWBO or were used to close out a previously established short position. Specifically, Defendant G1 EXECUTION SERVICES, LLC sold 900 shares at a price of \$1.16 per share at 09:53:58, after the Spoofing Episode, which generated a return of 3.571% on its Executing Purchases at the artificially depressed price of \$1.12 per share. Defendant G1 EXECUTION SERVICES, LLC also sold 28,445 shares at a price of \$1.14 per share at 09:50:44, prior to the Spoofing Episode, which generated a return of 1.786% if that sale created a short position that was closed out by the Executing Purchases at the artificially depressed price of \$1.12 per share.

6. November 18, 2020

146. As the following chart details, on November 18, 2020, Defendants submitted 23,850 shares of fictitious Baiting Orders at share prices ranging from \$2.80 to \$1.27 on OTC Link LLC. Defendants never intended for these Baiting Orders to be filled, but instead, planned to cancel them before placing the orders. The Baiting Orders successfully induced the entry of sell orders from other market participants, artificially driving down the price of NWBO shares by -2.532% on average. Defendants then rapidly reversed course and purchased a total of 1,550 shares below the prevailing best offer prior to entry of the Baiting Orders.³² Shortly thereafter, Defendants cancelled all of the fictitious Baiting Orders.

147. For each Defendant, the following table lists the share volume of Baiting Orders which were subsequently cancelled, share volume of one of the Executing Purchases per Spoofing

³² See footnote 4 above.

Episode which were executed at depressed prices, and the resulting price decline in NWBO shares on November 18, 2020:

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
CANACCORD GENUITY LLC	1	4,900	1,100	-2.92%
CITADEL SECURITIES LLC	1	9,950	350	-1.575%
G1 EXECUTION SERVICES, LLC	1	9,000	100	-3.101%

148. During the Baiting Period for each Spoofing Episode that day, Defendants submitted new sell-side orders for an average of 17,884 shares per Executing Purchase. During the same time window prior to non-spoofed executed purchases that day, market participants submitted new sell-side orders for an average of 3,371 shares per purchase.

149. During the Cancellation Period following the Executing Purchases, Defendants cancelled an average of 10,950 shares in sell-side orders, or 61.23% of the created volume of 17,884 sell-side shares. During the same time window as the Cancellation Period following non-spoofed executed purchases, market participants cancelled an average of 907 shares in sell-side orders, or 26.9% of the created volume of 3,371 sell-side shares.

150. On average, therefore, there were 431% more sell-side shares created in the Baiting Period prior to Executing Purchases compared to non-spoofed executed purchases, and 1108% more sell-side shares cancelled in the Cancellation Period following Executing Purchases compared to non-spoofed executed purchases.

151. Defendants thus injected more artificial sell-side order flow than non-spoofed orders prior to buying shares, as measured by (1) the volume of sell side order flow (431% higher); (2) the cancellation of that order flow (1,108% higher); and (3) the greater share of cancelled sell-side order flow (61.23% vs. 26.9%).

152. This behavior is inconsistent with *bona fide* market making, which involves

purchases and sales in roughly comparable amounts to provide liquidity to customers or other broker-dealers while remaining roughly market neutral. Over Cancellation Periods, Defendants cancelled a median of 66% of the sell-side orders created during Baiting Periods, but only a median of 39% of the buy-side orders created during Baiting Periods. This asymmetry in the posting of new orders and order cancellation rates is thus inconsistent with *bona fide* market making.

a) *G1 EXECUTION SERVICES, LLC*

(1) Example Episode: November 18, 2020 - 10:01:59

153. On November 18, 2020 at 10:01:59, the best bid and offer for NWBO as calculated by Plaintiff was a bid to purchase 15,000 shares at a price of \$1.26 per share and an offer to sell 6,000 shares at a price of \$1.29 per share.³³

154. From 09:59:59 to 10:01:59, Defendant G1 EXECUTION SERVICES, LLC placed 9,000 shares of Baiting Orders at a price of \$1.32 per share. As of 10:01:59, the submission of these Baiting Orders left Defendant G1 EXECUTION SERVICES, LLC with an imbalanced order book position favoring the sell side consisting of bids to purchase 2,100 shares at a price of \$1.27 per share, and an offer to sell 10,000 shares at a price of \$1.30 per share.

155. Between 10:01:59 and 10:03:59, based on publicly available data accessible to Plaintiff, Defendant G1 EXECUTION SERVICES, LLC did not sell any shares of NWBO, which is consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant G1 EXECUTION SERVICES, LLC must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant G1 EXECUTION SERVICES, LLC sold some NWBO shares during this episode, such sales would

³³ The contemporaneous “inside quote” on OTC Link as of 10:01:59.763 was identical in price: a bid to purchase 16,600 shares at a price of \$1.26 per share and an offer to sell 6,000 shares at a price of \$1.29 per share.

be consistent with Defendant G1 EXECUTION SERVICES, LLC's conversion of spoofing profits into cash.

156. Defendant G1 EXECUTION SERVICES, LLC parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders, JANE STREET MARKETS, LLC had placed orders to sell 1,000 shares at prices as low as \$1.29, a better price than some or all of the Baiting Orders placed by Defendant G1 EXECUTION SERVICES, LLC. Parking its Baiting Orders behind orders by other market participants like JANE STREET MARKETS, LLC is further evidence that Defendant G1 EXECUTION SERVICES, LLC was not engaging in legitimate market activity. Only 3% of the non-spoofed executed purchases that day had the purchaser previously park sell-side orders behind other market participants.

157. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 10:01:59, Defendant G1 EXECUTION SERVICES, LLC took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 100 shares, at a price of \$1.27 per share, which was below the prevailing best offer of \$1.29 per share.³⁴

158. Defendant G1 EXECUTION SERVICES, LLC began to cancel these Baiting Orders within 19.9 seconds. By 10:03:59, Defendant G1 EXECUTION SERVICES, LLC had cancelled all of its Baiting Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant G1 EXECUTION SERVICES, LLC. After cancelling the Baiting Orders, Defendant G1 EXECUTION SERVICES, LLC had an order book position on the over-the-counter markets consisting of bids to purchase 21,000 shares at a

³⁴ See footnote 4 above.

price of \$1.25 per share and offers to sell 10,000 shares at a price of \$1.28 per share—dramatically reversing the position it had taken only moments before.

159. Defendant G1 EXECUTION SERVICES, LLC sold shares of NWBO both before and after this Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash regardless of whether the Executing Purchases established a long position in NWBO or were used to close out a previously established short position. Specifically, Defendant G1 EXECUTION SERVICES, LLC sold 17,005 shares at a price of \$1.30 per share at 11:50:18, after the Spoofing Episode, which generated a return of 2.362% on its Executing Purchases at the artificially depressed price of \$1.27 per share. Defendant G1 EXECUTION SERVICES, LLC also sold 11,000 shares at a price of \$1.35 per share at 15:57:53, prior to the Spoofing Episode, which generated a return of 6.299% if that sale created a short position that was closed out by the Executing Purchases at the artificially depressed price of \$1.27 per share.

7. December 24, 2020

160. As the following chart details, on December 24, 2020, Defendants submitted 330,199 shares of fictitious Baiting Orders at share prices ranging from \$3.70 to \$1.62 on OTC Link LLC. Defendants never intended for these Baiting Orders to be filled, but instead, planned to cancel them before placing the orders. The Baiting Orders successfully induced the entry of sell orders from other market participants, artificially driving down the price of NWBO shares by - 4.192% on average. Defendants then rapidly reversed course and purchased a total of 42,796 shares below the prevailing best offer prior to entry of the Baiting Orders.³⁵ Shortly thereafter, Defendants cancelled all of the fictitious Baiting Orders.

161. For each Defendant, the following table lists the share volume of Baiting Orders

³⁵ See footnote 4 above.

which were subsequently cancelled, share volume of one of the Executing Purchases per Spoofing Episode which were executed at depressed prices, and the resulting price decline in NWBO shares on December 24, 2020:

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
CANACCORD GENUITY LLC	2	60,385	2,206	-7.005%
CITADEL SECURITIES LLC	8	162,265	29,523	-3.645%
G1 EXECUTION SERVICES, LLC	2	53,300	4,910	-5.559%
GTS SECURITIES LLC	4	29,699	5,857	-4.10%
VIRTU AMERICAS LLC	1	24,550	300	-0.5814%

162. During the Baiting Period for each Spoofing Episode that day, Defendants submitted new sell-side orders for an average of 35,418 shares per Executing Purchase. During the same time window prior to non-spoofed executed purchases that day, market participants submitted new sell-side orders for an average of 11,548 shares per purchase.

163. During the Cancellation Period following the Executing Purchases, Defendants cancelled an average of 28,039 shares in sell-side orders, or 79.16% of the created volume of 35,418 sell-side shares. During the same time window as the Cancellation Period following non-spoofed executed purchases, market participants cancelled an average of 1,271 shares in sell-side orders, or 11.01% of the created volume of 11,548 sell-side shares.

164. On average, therefore, there were 207% more sell-side shares created in the Baiting Period prior to Executing Purchases compared to non-spoofed executed purchases, and 2105% more sell-side shares cancelled in the Cancellation Period following Executing Purchases compared to non-spoofed executed purchases.

165. Defendants thus injected more artificial sell-side order flow than non-spoofed orders prior to buying shares, as measured by (1) the volume of sell side order flow (207% higher); (2) the cancellation of that order flow (2,105% higher); and (3) the greater share of cancelled sell-

side order flow (79.16% vs. 11.01%).

a) CANACCORD GENUITY LLC

(1) Example Episode: December 24, 2020 - 10:51:52

166. On December 24, 2020 at 10:51:52, the best bid and offer for NWBO as calculated by Plaintiff was a bid to purchase 1,100 shares at a price of \$1.69 per share and an offer to sell 1,100 shares at a price of \$1.72 per share.³⁶

167. From 10:49:52 to 10:51:52, Defendant CANACCORD GENUITY LLC placed 18,476 shares of Baiting Orders at prices ranging from \$3.40 to \$1.64 per share. As of 10:51:52 the submission of these Baiting Orders left Defendant CANACCORD GENUITY LLC with an imbalanced order book position favoring the sell side consisting of no bids and an offer to sell 14,576 shares at a price of \$1.72 per share.

168. Between 10:51:52 and 10:53:52, based on publicly available data accessible to Plaintiff, Defendant CANACCORD GENUITY LLC did not sell any shares of NWBO, which is consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant CANACCORD GENUITY LLC must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant CANACCORD GENUITY LLC sold some NWBO shares during this episode, such sales would be consistent with Defendant CANACCORD GENUITY LLC's conversion of spoofing profits into cash.

169. Defendant CANACCORD GENUITY LLC parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders,

³⁶ The contemporaneous "inside quote" on OTC Link as of 10:51:51.032 was almost identical in price: a bid to purchase 7,606 shares at a price of \$1.70 per share and an offer to sell 16,977 shares at a price of \$1.72 per share.

JANE STREET MARKETS, LLC had placed orders to sell 1,000 shares at prices as low as \$1.72, a better price than some or all of the Baiting Orders placed by Defendant CANACCORD GENUITY LLC. Parking its Baiting Orders behind orders by other market participants like JANE STREET MARKETS, LLC is further evidence that Defendant CANACCORD GENUITY LLC was not engaging in legitimate market activity. None of the non-spoofed executed purchases that day had the purchaser previously park sell-side orders behind other market participants.

170. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 10:51:52, Defendant CANACCORD GENUITY LLC took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 1,306 shares, at a price of \$1.70 per share, which was below the prevailing best offer of \$1.72 per share.³⁷

171. Defendant CANACCORD GENUITY LLC began to cancel these Baiting Orders within 3.504 seconds. By 10:53:52, Defendant CANACCORD GENUITY LLC had cancelled all of its Baiting Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant CANACCORD GENUITY LLC. After cancelling the Baiting Orders, Defendant CANACCORD GENUITY LLC had an order book position on the over-the-counter markets consisting of bids to purchase 1,000 shares at a price of \$1.64 per share and offers to sell 5,545 shares at a price of \$1.67 per share – dramatically reversing the position it had taken only moments before.

172. Defendant CANACCORD GENUITY LLC sold shares of NWBO both before and after this Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash regardless of whether the Executing Purchases established a long position in NWBO or were used

³⁷ See footnote 4 above.

to close out a previously established short position. Specifically, Defendant CANACCORD GENUITY LLC sold 500 shares at a price of \$1.73 per share at 11:20:02, after the Spoofing Episode, which generated a return of 1.765% on its Executing Purchases at the artificially depressed price of \$1.70 per share. Defendant CANACCORD GENUITY LLC also sold 2,100 shares at a price of \$1.80 per share at 10:47:41, prior to the Spoofing Episode, which generated a return of 5.882% if that sale created a short position that was closed out by the Executing Purchases at the artificially depressed price of \$1.70 per share.

8. February 1, 2021

173. As the following chart details, on February 1, 2021, Defendants submitted 28,924 shares of fictitious Baiting Orders at share prices ranging from \$1.67 to \$1.53 on OTC Link LLC and NYSE ARCA Global OTC. Defendants never intended for these Baiting Orders to be filled, but instead, planned to cancel them before placing the orders. The Baiting Orders successfully induced the entry of sell orders from other market participants, artificially driving down the price of NWBO shares by -2.013% on average. Defendants then rapidly reversed course and purchased a total of 10,923 shares below the prevailing best offer prior to entry of the Baiting Orders.³⁸ Shortly thereafter, Defendants cancelled all of the fictitious Baiting Orders.

174. For each Defendant, the following table lists the share volume of Baiting Orders which were subsequently cancelled, share volume of one of the Executing Purchases per Spoofing Episode which were executed at depressed prices, and the resulting price decline in NWBO shares on February 1, 2021:

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
CITADEL SECURITIES LLC	4	23,524	7,168	-1.746%

³⁸ See footnote 4 above.

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
GTS SECURITIES LLC	1	2,400	755	-2.516%
LIME TRADING CORP.	1	3,000	3,000	-2.581%

175. During the Baiting Period for each Spoofing Episode that day, Defendants submitted new sell-side orders for an average of 6,950 shares per Executing Purchase. During the same time window prior to non-spoofed executed purchases that day, market participants submitted new sell-side orders for an average of 795 shares per purchase.

176. During the Cancellation Period following the Executing Purchases, Defendants cancelled an average of 8,549 shares in sell-side orders, or 123% of the created volume of 6,950 sell-side shares. During the same time window as the Cancellation Period following non-spoofed executed purchases, market participants cancelled an average of 743 shares in sell-side orders, or 93.44% of the created volume of 795 sell-side shares.

177. On average, therefore, there were 775% more sell-side shares created in the Baiting Period prior to Executing Purchases compared to non-spoofed executed purchases, and 1051% more sell-side shares cancelled in the Cancellation Period following Executing Purchases compared to non-spoofed executed purchases.

178. Defendants thus injected more artificial sell-side order flow than non-spoofed orders prior to buying shares, as measured by (1) the volume of sell side order flow (775% higher); (2) the cancellation of that order flow (1,051% higher); and (3) the greater share of cancelled sell-side order flow (123% vs. 93.44%).

a) GTS SECURITIES LLC

(1) Example Episode: February 1, 2021 - 09:30:51

179. On February 1, 2021 at 09:30:51, the best bid and offer for NWBO as calculated

by Plaintiff was a bid to purchase 2,600 shares at a price of \$1.56 per share and an offer to sell 509 shares at a price of \$1.59 per share.³⁹

180. From 09:28:51 to 09:30:51, Defendant GTS SECURITIES LLC placed 2,400 shares of Baiting Orders at a price of \$1.67 per share. As of 09:30:51 the submission of these Baiting Orders left Defendant GTS SECURITIES LLC with an imbalanced order book position favoring the sell side consisting of bids to purchase 1,525 shares at a price of \$1.56 per share, and an offer to sell 2,500 shares at a price of \$1.59 per share.

181. Between 09:30:51 and 09:32:51, Defendant GTS SECURITIES LLC, based on publicly available data accessible to Plaintiff, did not sell any shares of NWBO, which is consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant GTS SECURITIES LLC must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant GTS SECURITIES LLC sold some NWBO shares during this episode, such sales would be consistent with Defendant GTS SECURITIES LLC's conversion of spoofing profits into cash.

182. Defendant GTS SECURITIES LLC parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders, JANE STREET MARKETS, LLC had placed orders to sell 1,000 shares at prices as low as \$1.60, a better price than some or all of the Baiting Orders placed by Defendant GTS SECURITIES LLC. Parking its Baiting Orders behind orders by other market participants like JANE STREET MARKETS, LLC is further evidence that Defendant GTS SECURITIES LLC was not engaging in legitimate market activity. Only 4% of the non-spoofed executed purchases that day had the purchaser

³⁹ The contemporaneous "inside quote" on OTC Link as of 09:30:50.156 was identical in price: a bid to purchase 4,125 shares at a price of \$1.56 per share and an offer to sell 3,009 shares at a price of \$1.59 per share.

previously park sell-side orders behind other market participants.

183. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 09:30:51, Defendant GTS SECURITIES LLC took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 755 shares, at a price of \$1.56 per share, which was below the prevailing best offer of \$1.59 per share.⁴⁰

184. Defendant GTS SECURITIES LLC began to cancel these Baiting Orders within 3.457 seconds. By 09:32:51, Defendant GTS SECURITIES LLC had cancelled all of its Baiting Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant GTS SECURITIES LLC. After cancelling the Baiting Orders, Defendant GTS SECURITIES LLC had an order book position on the over-the-counter markets consisting of bids to purchase 485 shares at a price of \$1.55 per share and offers to sell 3,800 shares at a price of \$1.64 per share – dramatically reversing the position it had taken only moments before.

185. Defendant GTS SECURITIES LLC sold shares of NWBO both before and after this Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash regardless of whether the Executing Purchases established a long position in NWBO or were used to close out a previously established short position. Specifically, Defendant GTS SECURITIES LLC sold 7,930 shares at a price of \$1.57 per share at 11:04:58, after the Spoofing Episode, which generated a return of 0.641% on its Executing Purchases at the artificially depressed price of \$1.56 per share. Defendant GTS SECURITIES LLC also sold 4,181 shares at a price of \$1.58 per share at 12:31:01, prior to the Spoofing Episode, which generated a return of 1.282% if that sale created

⁴⁰ See footnote 4 above.

a short position that was closed out by the Executing Purchases at the artificially depressed price of \$1.56 per share.

b) LIME TRADING CORP.

(1) Example Episode: February 1, 2021 - 15:48:21

186. On February 1, 2021 at 15:48:21, the best bid and offer for NWBO as calculated by Plaintiff was a bid to purchase 3,150 shares at a price of \$1.53 per share and an offer to sell 3,115 shares at a price of \$1.55 per share.⁴¹

187. From 15:46:21 to 15:48:21, Defendant LIME TRADING CORP. placed 3,000 shares of Baiting Orders at prices ranging from \$1.56 to \$1.54 per share. As of 15:48:21 the submission of these Baiting Orders left Defendant LIME TRADING CORP. with an imbalanced order book position favoring the sell side consisting of bids to purchase 3,000 shares at a price of \$1.53 per share, and an offer to sell 6,000 shares at a price of \$1.55 per share.

188. Between 15:48:21 and 15:50:21, Defendant LIME TRADING CORP. based on publicly available data accessible to Plaintiff, did not sell any shares of NWBO, consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant LIME TRADING CORP. must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant LIME TRADING CORP. sold some NWBO shares during this episode, such sales would be consistent with Defendant LIME TRADING CORP.'s conversion of spoofing profits into cash.

189. Defendant LIME TRADING CORP. parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders, JANE

⁴¹ The contemporaneous "inside quote" on OTC Link as of 15:47:18.497 was identical in price: a bid to purchase 6,150 shares at a price of \$1.53 per share and an offer to sell 13,015 shares at a price of \$1.55 per share.

STREET MARKETS, LLC had placed orders to sell 1,000 shares at prices as low as \$1.55, a better price than some or all of the Baiting Orders placed by Defendant LIME TRADING CORP. Parking its Baiting Orders behind orders by other market participants like JANE STREET MARKETS, LLC is further evidence that Defendant LIME TRADING CORP. was not engaging in legitimate market activity. Only 4% of the non-spoofed executed purchases that day had the purchaser previously park sell-side orders behind other market participants.

190. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 15:48:21, Defendant LIME TRADING CORP. took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 3,000 shares, at a price of \$1.53 per share, which was below the prevailing best offer of \$1.55 per share.⁴²

191. Defendant LIME TRADING CORP. began to cancel these Baiting Orders within 19.1 seconds. By 15:50:21, Defendant LIME TRADING CORP., had cancelled all of its Baiting Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant LIME TRADING CORP. After cancelling the Baiting Orders, Defendant LIME TRADING CORP. had an order book position on the over-the-counter markets consisting of no bids and offers to sell 6,000 shares at a price of \$1.53 per share – dramatically reversing the position it had taken only moments before.

192. Defendant LIME TRADING CORP. sold shares of NWBO both before and after this Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash regardless of whether the Executing Purchases established a long position in NWBO or were used to close out a previously established short position. Specifically, Defendant LIME TRADING

⁴² See footnote 4 above.

CORP. sold 1,990 shares at a price of \$1.54 per share at 10:54:39 on February 02, 2021, after the Spoofing Episode, which generated a return of 0.6536% on its Executing Purchases at the artificially depressed price of \$1.53 per share. Defendant LIME TRADING CORP. also sold 3,000 shares at a price of \$1.55 per share at 14:58:31, prior to the Spoofing Episode, which generated a return of 1.307% if that sale created a short position that was closed out by the Executing Purchases at the artificially depressed price of \$1.53 per share.

9. May 17, 2021

193. As the following chart details, on May 17, 2021, Defendants submitted 495,874 shares of fictitious Baiting Orders at share prices ranging from \$2.05 to \$1.77 on OTC Link LLC and NYSE ARCA Global OTC. Defendants never intended for these Baiting Orders to be filled, but instead, planned to cancel them before placing the orders. The Baiting Orders successfully induced the entry of sell orders from other market participants, artificially driving down the price of NWBO shares by -2.446% on average. Defendants then rapidly reversed course and purchased a total of 126,035 shares below the prevailing best offer prior to entry of the Baiting Orders.⁴³ Shortly thereafter, Defendants cancelled all of the fictitious Baiting Orders.

194. For each Defendant, the following table lists the share volume of Baiting Orders which were subsequently cancelled, share volume of one of the Executing Purchases per Spoofing Episode which were executed at depressed prices, and the resulting price decline in NWBO shares on May 17, 2021:

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
CANACCORD GENUITY LLC	1	24,200	100	-1.015%
CITADEL SECURITIES LLC	17	118,400	37,299	-2.543%
GTS SECURITIES LLC	2	34,924	5,505	-1.173%

⁴³ See footnote 4 above.

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
INSTINET, LLC	13	64,400	16,008	-2.532%
LIME TRADING CORP.	30	243,000	64,081	-2.328%
VIRTU AMERICAS LLC	4	10,950	3,042	-3.624%

195. During the Baiting Period for each Spoofing Episode that day, Defendants submitted new sell-side orders for an average of 12,049 shares per Executing Purchase. During the same time window prior to non-spoofed executed purchases that day, market participants submitted new sell-side orders for an average of 6,728 shares per purchase.

196. During the Cancellation Period following the Executing Purchases, Defendants cancelled an average of 12,300 shares in sell-side orders, or 102.1% of the created volume of 12,049 sell-side shares. During the same time window as the Cancellation Period following non-spoofed executed purchases, market participants cancelled an average of 286 shares in sell-side orders, or 4.25% of the created volume of 6,728 sell-side shares.

197. On average, therefore, there were 79% more sell-side shares created in the Baiting Period prior to Executing Purchases compared to non-spoofed executed purchases, and 4,202% more sell-side shares cancelled in the Cancellation Period following Executing Purchases compared to non-spoofed executed purchases.

198. Defendants thus injected more artificial sell-side order flow than non-spoofed orders prior to buying shares, as measured by (1) the volume of sell side order flow (79% higher); (2) the cancellation of that order flow (4,202% higher); and (3) the greater share of cancelled sell-side order flow (102.1% vs. 4.25%).

199. This behavior is inconsistent with *bona fide* market making, which involves purchases and sales in roughly comparable amounts to provide liquidity to customers or other broker-dealers while remaining roughly market neutral. Over Baiting Periods, Defendants posted

a median of 180% more new sell-side orders than new buy-side orders. Over Cancellation Periods, Defendants cancelled a median of 78% of the sell-side orders created during Baiting Periods, but only a median of 44% of the buy-side orders created during Baiting Periods. This asymmetry in order cancellation rates is thus inconsistent with *bona fide* market making.

a) *VIRTU AMERICAS LLC*

(1) Example Episode: May 17, 2021 - 11:19:58

200. On May 17, 2021 at 11:19:58, the best bid and offer for NWBO as calculated by Plaintiff was a bid to purchase 1,000 shares at a price of \$1.85 per share and an offer to sell 1,100 shares at a price of \$1.86 per share.⁴⁴

201. From 11:17:58 to 11:19:58, Defendant VIRTU AMERICAS LLC placed 3,800 shares of Baiting Orders at a price of \$1.93 per share. As of 11:19:58 the submission of these Baiting Orders left Defendant VIRTU AMERICAS LLC with an imbalanced order book position favoring the sell side consisting of no bids and an offer to sell 2,000 shares at a price of \$1.87 per share.

202. Between 11:19:58 and 11:21:58, Defendant VIRTU AMERICAS LLC, based on publicly available data accessible to Plaintiff, did not sell any shares of NWBO, which is consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant VIRTU AMERICAS LLC must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant VIRTU AMERICAS LLC sold some NWBO shares during this episode, such sales would be consistent with Defendant VIRTU AMERICAS LLC's conversion of spoofing profits into cash.

⁴⁴ The contemporaneous "inside quote" on OTC Link as of 11:19:56.878 was identical in price: a bid to purchase 2,000 shares at a price of \$1.85 per share and an offer to sell 4,100 shares at a price of \$1.86 per share.

203. Defendant VIRTU AMERICAS LLC parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders, JANE STREET MARKETS, LLC had placed orders to sell 1,000 shares at prices as low as \$1.86, a better price than some or all of the Baiting Orders placed by Defendant VIRTU AMERICAS LLC. Parking its Baiting Orders behind orders by other market participants like JANE STREET MARKETS, LLC is further evidence that Defendant VIRTU AMERICAS LLC was not engaging in legitimate market activity. Only 2% of the non-spoofed executed purchases that day had the purchaser previously park sell-side orders behind other market participants.

204. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 11:19:58, Defendant VIRTU AMERICAS LLC took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 500 shares, at a price of \$1.85 per share, which was below the prevailing best offer of \$1.86 per share.⁴⁵

205. Defendant VIRTU AMERICAS LLC began to cancel these Baiting Orders within 3.466 seconds. By 11:21:58, Defendant VIRTU AMERICAS LLC, had cancelled all of its Baiting Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant VIRTU AMERICAS LLC. After cancelling the Baiting Orders, Defendant VIRTU AMERICAS LLC had an order book position on the over-the-counter markets consisting of bids to purchase 1,217 shares at a price of \$1.87 per share and offers to sell 100 shares at a price of \$1.93 per share – dramatically reversing the position it had taken only moments before.

206. Defendant VIRTU AMERICAS LLC sold shares of NWBO both before and after

⁴⁵ See footnote 4 above.

this Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash regardless of whether the Executing Purchases established a long position in NWBO or were used to close out a previously established short position. Specifically, Defendant VIRTU AMERICAS LLC sold 500 shares at a price of \$1.94 per share at 11:32:42, after the Spoofing Episode, which generated a return of 4.865% on its Executing Purchases at the artificially depressed price of \$1.85 per share. Defendant VIRTU AMERICAS LLC also sold 1,502 shares at a price of \$2.00 per share at 11:11:02, prior to the Spoofing Episode, which generated a return of 8.108% if that sale created a short position that was closed out by the Executing Purchases at the artificially depressed price of \$1.85 per share.

10. May 9, 2022

207. As the following chart details, on May 9, 2022, Defendants submitted 632,901 shares of fictitious Baiting Orders at share prices ranging from \$2.50 to \$1.83 on OTC Link LLC and NYSE ARCA Global OTC. Defendants never intended for these Baiting Orders to be filled, but instead, planned to cancel them before placing the orders. The Baiting Orders successfully induced the entry of sell orders from other market participants, artificially driving down the price of NWBO shares by -2.623% on average. Defendants then rapidly reversed course and purchased a total of 77,977 shares below the prevailing best offer prior to entry of the Baiting Orders.⁴⁶ Shortly thereafter, Defendants cancelled all of the fictitious Baiting Orders.

208. For each Defendant, the following table lists the share volume of Baiting Orders which were subsequently cancelled, share volume of one of the Executing Purchases per Spoofing Episode which were executed at depressed prices, and the resulting price decline in NWBO shares on May 9, 2022:

⁴⁶ See footnote 4 above.

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
CANACCORD GENUITY LLC	7	104,500	15,672	-3.714%
CITADEL SECURITIES LLC	14	227,105	29,627	-2.124%
G1 EXECUTION SERVICES, LLC	4	3,330	1,731	-5.174%
INSTINET, LLC	46	183,466	15,133	-2.247%
VIRTU AMERICAS LLC	3	114,500	15,814	-4.772%

209. During the Baiting Period for each Spoofing Episode that day, Defendants submitted new sell-side orders for an average of 11,986 shares per Executing Purchase. During the same time window prior to non-spoofed executed purchases that day, market participants submitted new sell-side orders for an average of 4,013 shares per purchase.

210. During the Cancellation Period following the Executing Purchases, Defendants cancelled an average of 12,094 shares in sell-side orders, or 100.9% of the created volume of 11,986 sell-side shares. During the same time window as the Cancellation Period following non-spoofed executed purchases, market participants cancelled an average of 396 shares in sell-side orders, or 9.86% of the created volume of 4,013 sell-side shares.

211. On average, therefore, there were 199% more sell-side shares created in the Baiting Period prior to Executing Purchases compared to non-spoofed executed purchases, and 2957% more sell-side shares cancelled in the Cancellation Period following Executing Purchases compared to non-spoofed executed purchases.

212. Defendants thus injected more artificial sell-side order flow than non-spoofed orders prior to buying shares, as measured by (1) the volume of sell side order flow (199% higher); (2) the cancellation of that order flow (2,957% higher); and (3) the greater share of cancelled sell-side order flow (100.9% vs. 9.86%).

a) *INSTINET, LLC*

(1) Example Episode: May 9, 2022 – 14:46:35

213. On May 9, 2022 at 14:46:35, the best bid and offer for NWBO as calculated by Plaintiff was a bid to purchase 1,000 shares at a price of \$1.89 per share and an offer to sell 452 shares at a price of \$1.90 per share.⁴⁷

214. From 14:44:35 to 14:46:35, Defendant INSTINET, LLC placed 10,580 shares of Baiting Orders at prices ranging from \$1.92 to \$1.90 per share. As of 14:46:35, the submission of these Baiting Orders left Defendant INSTINET, LLC with an imbalanced order book position favoring the sell side consisting of bids to purchase 5,005 shares at prices ranging from \$1.87 per share to \$1.89 per share, and an offer to sell 5,744 shares at prices ranging from \$1.91 per share to \$1.92 per share.

215. Between 14:46:35 and 14:48:35, Defendant INSTINET, LLC, based on publicly available data accessible to Plaintiff, did not sell any shares of NWBO, which is consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant INSTINET, LLC must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant INSTINET, LLC sold some NWBO shares during this episode, such sales would be consistent with Defendant INSTINET, LLC's conversion of spoofing profits into cash.

216. Defendant INSTINET, LLC parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders, JANE STREET MARKETS, LLC had placed orders to sell 1,000 shares at prices as low as \$1.91, a better price

⁴⁷ The contemporaneous “inside quote” on OTC Link as of 14:46:33.448 was almost identical in price: a bid to purchase 1,250 shares at a price of \$1.89 per share and an offer to sell 1,600 shares at a price of \$1.91 per share.

than some or all of the Baiting Orders placed by Defendant INSTINET, LLC. Parking its Baiting Orders behind orders by other market participants like JANE STREET MARKETS, LLC is further evidence that Defendant INSTINET, LLC was not engaging in legitimate market activity. Only 4% of the non-spoofed executed purchases that day had the purchaser previously park sell-side orders behind other market participants.

217. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 14:46:35, Defendant INSTINET, LLC took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 133 shares, at a price of \$1.89 per share, which was below the prevailing best offer of \$1.90 per share.⁴⁸

218. Defendant INSTINET, LLC began to cancel these Baiting Orders within 1.184 seconds. By 14:48:35 Defendant INSTINET, LLC, had cancelled all of its Baiting Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant INSTINET, LLC. After cancelling the Baiting Orders, Defendant INSTINET, LLC had an order book position on the over-the-counter markets consisting of bids to purchase 5,505 shares at prices ranging from \$1.87 per share to \$1.88 per share and offers to sell 3,800 shares at a price of \$1.90 per share – dramatically reversing the position it had taken only moments before.

219. Defendant INSTINET, LLC sold shares of NWBO both before and after this Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash regardless of whether the Executing Purchases established a long position in NWBO or were used to close out a previously established short position. Specifically, Defendant INSTINET, LLC sold 700

⁴⁸ See footnote 4 above.

shares at a price of \$1.90 per share at 14:48:52, after the Spoofing Episode, which generated a return of 0.5291% on its Executing Purchases at the artificially depressed price of \$1.89 per share. Defendant INSTINET, LLC also sold 1,500 shares at a price of \$1.90 per share at 14:44:42, prior to the Spoofing Episode, which generated a return of 0.5291% if that sale created a short position that was closed out by the Executing Purchases at the artificially depressed price of \$1.89 per share.

11. May 10, 2022

220. As the following chart details, on May 10, 2022, Defendants submitted 2,883,387 shares of fictitious Baiting Orders at share prices ranging from \$1.68 to \$0.40 on OTC Link LLC and NYSE ARCA Global OTC. Defendants never intended for these Baiting Orders to be filled, but instead, planned to cancel them before placing the orders. The Baiting Orders successfully induced the entry of sell orders from other market participants, artificially driving down the price of NWBO shares by -11.77% on average. Defendants then rapidly reversed course and purchased a total of 509,062 shares below the prevailing best offer prior to entry of the Baiting Orders.⁴⁹ Shortly thereafter, Defendants cancelled all of the fictitious Baiting Orders.

221. For each Defendant, the following table lists the share volume of Baiting Orders which were subsequently cancelled, share volume of one of the Executing Purchases per Spoofing Episode which were executed at depressed prices, and the resulting price decline in NWBO shares on May 10, 2022:

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
CANACCORD GENUITY LLC	10	190,338	14,416	-11.95%
CITADEL SECURITIES LLC	29	977,605	104,969	-11.38%
G1 EXECUTION SERVICES, LLC	8	282,089	25,650	-16.63%

⁴⁹ See footnote 4 above.

Defendant	No. of Episodes	Baiting Orders	Executing Purchases	Average Price Decline
GTS SECURITIES LLC	33	1,078,066	287,760	-11.01%
INSTINET, LLC	9	83,125	4,250	-11.30%
VIRTU AMERICAS LLC	11	272,164	72,017	-11.74%

222. During the Baiting Period for each Spoofing Episode that day, Defendants submitted new sell-side orders for an average of 50,426 shares per Executing Purchase. During the same time window prior to non-spoofed executed purchases that day, market participants submitted new sell-side orders for an average of 4,177 shares per purchase.

223. During the Cancellation Period following the Executing Purchases, Defendants cancelled an average of 47,473 shares in sell-side orders, or 94.15% of the created volume of 50,426 sell-side shares. During the same time window as the Cancellation Period following non-spoofed executed purchases, market participants cancelled an average of 2,210 shares in sell-side orders, or 52.9% of the created volume of 4,177 sell-side shares.

224. On average, therefore, there were 1,107% more sell-side shares created in the Baiting Period prior to Executing Purchases compared to non-spoofed executed purchases, and 2,048% more sell-side shares cancelled in the Cancellation Period following Executing Purchases compared to non-spoofed executed purchases.

225. Defendants thus injected more artificial sell-side order flow than non-spoofed orders prior to buying shares, as measured by (1) the volume of sell side order flow (1,107% higher); (2) the cancellation of that order flow (2,048% higher); and (3) the greater share of cancelled sell-side order flow (94.15% vs. 52.9%).

226. This behavior is inconsistent with *bona fide* market making, which involves purchases and sales in roughly comparable amounts to provide liquidity to customers or other broker-dealers while remaining roughly market neutral. Over Baiting Periods, Defendants posted

a median of infinitely more new sell-side orders than new buy-side orders (*i.e.*, there were zero buy-side orders on median). Over Cancellation Periods, Defendants cancelled a median of 142% of the sell-side orders created during Baiting Periods, but only a median of 8% of the buy-side orders created during Baiting Periods. This asymmetry in order cancellation rates is thus inconsistent with *bona fide* market making.

a) *GTS SECURITIES LLC*

(1) Example Episode: May 10, 2022 - 12:53:43

227. On May 10, 2022 at 12:53:43, the best bid and offer for NWBO as calculated by Plaintiff was a bid to purchase 16,000 shares at a price of \$0.56 per share and an offer to sell 2,000 shares at a price of \$0.565 per share.⁵⁰

228. From 12:51:43 to 12:53:43, Defendant GTS SECURITIES LLC placed 4,000 shares of Baiting Orders at a price of \$0.5985 per share. As of 12:53:43 the submission of these Baiting Orders left Defendant GTS SECURITIES LLC with an imbalanced order book position favoring the sell side consisting of no bids and an offer to sell 5,000 shares at a price of \$0.57 per share.

229. Between 12:53:43 and 12:55:43, Defendant GTS SECURITIES LLC, based on publicly available data accessible to Plaintiff, did not sell any shares of NWBO, which is consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant GTS SECURITIES LLC must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant GTS SECURITIES LLC sold some NWBO shares during this episode, such sales would be consistent with Defendant GTS

⁵⁰ The contemporaneous “inside quote” on OTC Link as of 12:53:43.227 was identical in price: a bid to purchase 9,500 shares at a price of \$0.56 per share and an offer to sell 1,000 shares at a price of \$0.565 per share.

SECURITIES LLC's conversion of spoofing profits into cash.

230. Defendant GTS SECURITIES LLC parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders, CELADON FINANCIAL GROUP LLC had placed orders to sell 1,000 shares at prices as low as \$0.565, a better price than some or all of the Baiting Orders placed by Defendant GTS SECURITIES LLC. Parking its Baiting Orders behind orders by other market participants like CELADON FINANCIAL GROUP LLC is further evidence that Defendant GTS SECURITIES LLC was not engaging in legitimate market activity. Only 6% of the non-spoofed executed purchases that day had the purchaser previously park sell-side orders behind other market participants.

231. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 12:53:43, Defendant GTS SECURITIES LLC took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 3,500 shares, at a price of \$0.56 per share, which was below the prevailing best offer of \$0.565 per share.⁵¹

232. Defendant GTS SECURITIES LLC began to cancel these Baiting Orders within 1.477 seconds. By 12:55:43, Defendant GTS SECURITIES LLC, had cancelled all of its Baiting Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant GTS SECURITIES LLC. After cancelling the Baiting Orders, Defendant GTS SECURITIES LLC had an order book position on the over-the-counter markets consisting of bids to purchase 5,445 shares at a price of \$0.521 per share and offers to sell 1,000 shares at a price of \$0.5985 per share – dramatically reversing the position it had taken only

⁵¹ See footnote 4 above.

moments before.

233. Defendant GTS SECURITIES LLC sold shares of NWBO both before and after this Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash regardless of whether the Executing Purchases established a long position in NWBO or were used to close out a previously established short position. Specifically, Defendant GTS SECURITIES LLC sold 22,500 shares at a price of \$0.5799 per share at 12:56:40, after the Spoofing Episode, which generated a return of 3.554% on its Executing Purchases at the artificially depressed price of \$0.56 per share. Defendant GTS SECURITIES LLC also sold 3,094 shares at a price of \$0.59 per share at 12:27:11, prior to the Spoofing Episode, which generated a return of 5.357% if that sale created a short position that was closed out by the Executing Purchases at the artificially depressed price of \$0.56 per share.

b) CITADEL SECURITIES LLC

(1) Example Episode: May 10, 2022 – 11:27:43

234. On May 10, 2022 at 11:27:43, the best bid and offer for NWBO as calculated by Plaintiff was a bid to purchase 1,000 shares at a price of \$0.89 per share and an offer to sell 31,500 shares at a price of \$0.90 per share.⁵²

235. From 11:25:43 to 11:27:43, Defendant CITADEL SECURITIES LLC placed 30,958 shares of Baiting Orders at prices ranging from \$0.95 to \$0.8801 per share. As of 11:27:43 the submission of these Baiting Orders left Defendant CITADEL SECURITIES LLC with an imbalanced order book position favoring the sell side consisting of bids to purchase 4,000 shares at a price of \$0.88 per share, and an offer to sell 7,730 shares at a price of \$0.9163 per share.

⁵² The contemporaneous “inside quote” on OTC Link as of 11:27:42.634 was identical in price: a bid to purchase 1,000 shares at a price of \$0.89 per share and an offer to sell 85,215 shares at a price of \$0.90 per share.

236. Between 11:27:43 and 11:29:43, Defendant CITADEL SECURITIES LLC, based on publicly available data accessible to Plaintiff, did not sell any shares of NWBO, which is consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant CITADEL SECURITIES LLC must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant CITADEL SECURITIES LLC sold some NWBO shares during this episode, such sales would be consistent with Defendant CITADEL SECURITIES LLC's conversion of spoofing profits into cash.

237. Defendant CITADEL SECURITIES LLC parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders, ASCENDIANT CAPITAL MARKETS, LLC had placed orders to sell 1,000 shares at prices as low as \$0.9301, a better price than some or all of the Baiting Orders placed by Defendant CITADEL SECURITIES LLC. Parking its Baiting Orders behind orders by other market participants like ASCENDIANT CAPITAL MARKETS, LLC is further evidence that Defendant CITADEL SECURITIES LLC was not engaging in legitimate market activity. Only 6% of the non-spoofed executed purchases that day had the purchaser previously park sell-side orders behind other market participants.

238. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 11:27:43 Defendant CITADEL SECURITIES LLC took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 2,000 shares, at a price of \$0.88 per share, which was below the prevailing best offer of \$0.90 per share.⁵³

239. Defendant CITADEL SECURITIES LLC began to cancel these Baiting Orders

⁵³ See footnote 4 above.

within 3.177 seconds. By 11:29:43, Defendant CITADEL SECURITIES LLC had cancelled all of its Baiting Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant CITADEL SECURITIES LLC. After cancelling the Baiting Orders, Defendant CITADEL SECURITIES LLC had an order book position on the over-the-counter markets consisting of bids to purchase 1,060 shares at a price of \$0.94 per share and offers to sell 1,000 shares at a price of \$0.95 per share – dramatically reversing the position it had taken only moments before.

240. Defendant CITADEL SECURITIES LLC sold shares of NWBO both before and after this Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash regardless of whether the Executing Purchases established a long position in NWBO or were used to close out a previously established short position. Specifically, Defendant CITADEL SECURITIES LLC sold 4,870 shares at a price of \$0.93 per share at 11:30:18, after the Spoofing Episode, which generated a return of 5.682% on its Executing Purchases at the artificially depressed price of \$0.88 per share. Defendant CITADEL SECURITIES LLC also sold 500 shares at a price of \$1.15 per share at 11:24:11, prior to the Spoofing Episode, which generated a return of 30.68% if that sale created a short position that was closed out by the Executing Purchases at the artificially depressed price of \$0.88 per share.

c) CANACCORD GENUITY LLC

(1) Example Episode: May 10, 2022 – 09:47:08

241. On May 10, 2022 at 09:47:08, the best bid and offer for NWBO as calculated by Plaintiff based on publicly available data accessible to Plaintiff was a bid to purchase 5,050 shares

at a price of \$1.43 per share and an offer to sell 27,095 shares at a price of \$1.44 per share.⁵⁴

242. From 09:45:08 to 09:47:08, Defendant CANACCORD GENUITY LLC placed 9,740 shares of Baiting Orders at prices ranging from \$1.48 to \$1.42 per share. As of 09:47:08, the submission of these Baiting Orders left Defendant CANACCORD GENUITY LLC with an imbalanced order book position favoring the sell side consisting of bids to purchase 800 shares at prices ranging from \$1.42 per share to \$1.43 per share, and an offer to sell 1,000 shares at a price of \$1.44 per share.

243. Between 09:47:08 and 09:49:08, Defendant CANACCORD GENUITY LLC, based on publicly available data accessible to Plaintiff, did not sell any shares of NWBO, consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant CANACCORD GENUITY LLC must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant CANACCORD GENUITY LLC sold some NWBO shares during this episode, such sales would be consistent with Defendant CANACCORD GENUITY LLC's conversion of spoofing profits into cash.

244. Defendant CANACCORD GENUITY LLC parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders, ASCENDIANT CAPITAL MARKETS, LLC had placed orders to sell 100 shares at prices as low as \$1.45, a better price than some or all of the Baiting Orders placed by Defendant CANACCORD GENUITY LLC. Parking its Baiting Orders behind orders by other market participants like ASCENDIANT CAPITAL MARKETS, LLC is further evidence that Defendant CANACCORD

⁵⁴ The contemporaneous "inside quote" on OTC Link as of 09:47:07.747 was identical in price: a bid to purchase 17,748 shares at a price of \$0.76 per share and an offer to sell 3,300 shares at a price of \$0.7601 per share.

GENUITY LLC was not engaging in legitimate market activity. Only 6% of the non-spoofed executed purchases that day had the purchaser previously park sell-side orders behind other market participants.

245. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 09:47:08, Defendant CANACCORD GENUITY LLC took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 100 shares, at a price of \$1.43 per share, which was below the prevailing best offer of \$1.44 per share.⁵⁵

246. Defendant CANACCORD GENUITY LLC began to cancel these Baiting Orders within 24.57 seconds. By 09:49:08, Defendant CANACCORD GENUITY LLC had cancelled all of its Baiting Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant CANACCORD GENUITY LLC. After cancelling the Baiting Orders, Defendant CANACCORD GENUITY LLC had an order book position on the over-the-counter markets consisting of bids to purchase 100 shares at a price of \$1.42 per share and offers to sell 5,100 shares at prices ranging from \$1.46 per share to \$143.00 per share – dramatically reversing the position it had taken only moments before.

247. Defendant CANACCORD GENUITY LLC sold shares of NWBO both before and after this Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash regardless of whether the Executing Purchases established a long position in NWBO or were used to close out a previously established short position. Specifically, Defendant CANACCORD GENUITY LLC sold 3,700 shares at a price of \$1.47 per share at 09:49:59, after the Spoofing Episode, which generated a return of 2.797% on its Executing Purchases at the artificially

⁵⁵ See footnote 4 above.

depressed price of \$1.43 per share. Defendant CANACCORD GENUITY LLC also sold 100 shares at a price of \$1.86 per share at 15:53:24, prior to the Spoofing Episode, which generated a return of 30.07% if that sale created a short position that was closed out by the Executing Purchases at the artificially depressed price of \$1.43 per share.

d) G1 EXECUTION SERVICES, LLC

(1) Example Episode: May 10, 2022 – 11:54:48

248. On May 10, 2022 at 11:54:48, the best bid and offer for NWBO as calculated by Plaintiff based on publicly available data accessible to Plaintiff was a bid to purchase 100 shares at a price of \$0.76 per share and an offer to sell 1,000 shares at a price of \$0.7601 per share.⁵⁶

249. From 11:52:48 to 11:54:48, Defendant G1 EXECUTION SERVICES, LLC placed 30,407 shares of Baiting Orders at a price of \$0.8001 per share. As of 11:54:48 the submission of these Baiting Orders left Defendant G1 EXECUTION SERVICES, LLC with an imbalanced order book position favoring the sell side consisting of bids to purchase 2,550 shares at a price of \$0.76 per share, and an offer to sell 40,407 shares at a price of \$0.8101 per share.

250. Between 11:54:48 and 11:56:48, Defendant G1 EXECUTION SERVICES, LLC did not sell any shares of NWBO, which is consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant G1 EXECUTION SERVICES must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant G1 EXECUTION SERVICES sold some NWBO shares during this episode, such sales would be consistent with Defendant G1 EXECUTION SERVICES's conversion of spoofing profits into cash.

⁵⁶ The contemporaneous “inside quote” on OTC Link as of 11:54:48.007 was identical in price: a bid to purchase 17,748 shares at a price of \$0.76 per share and an offer to sell 3,300 shares at a price of \$0.7601 per share.

251. Defendant G1 EXECUTION SERVICES, LLC parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders, JANE STREET MARKETS, LLC had placed orders to sell 1,000 shares at prices as low as \$0.7881, a better price than some or all of the Baiting Orders placed by Defendant G1 EXECUTION SERVICES, LLC. Parking its Baiting Orders behind orders by other market participants like JANE STREET MARKETS, LLC is further evidence that Defendant G1 EXECUTION SERVICES, LLC was not engaging in legitimate market activity. Only 6% of the non-spoofed executed purchases that day had the purchaser previously park sell-side orders behind other market participants.

252. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 11:54:48, Defendant G1 EXECUTION SERVICES, LLC took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 1,550 shares, at a price of \$0.76 per share, which was below the prevailing best offer of \$0.7601 per share.⁵⁷

253. Defendant G1 EXECUTION SERVICES, LLC began to cancel these Baiting Orders within 27.74 seconds. By 11:56:48 Defendant G1 EXECUTION SERVICES, LLC, had cancelled all of its Baiting Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant G1 EXECUTION SERVICES, LLC. After cancelling the Baiting Orders, Defendant G1 EXECUTION SERVICES, LLC had an order book position on the over-the-counter markets consisting of bids to purchase 11,500 shares at a price of \$0.70 per share and offers to sell 1,000 shares at a price of \$0.8001 per share—dramatically reversing the position it had taken only moments before.

⁵⁷ See footnote 4 above.

254. Defendant G1 EXECUTION SERVICES, LLC sold shares of NWBO both before and after this Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash regardless of whether the Executing Purchases established a long position in NWBO or were used to close out a previously established short position. Specifically, Defendant G1 EXECUTION SERVICES, LLC sold 12,200 shares at a price of \$0.83 per share at 14:50:48, after the Spoofing Episode, which generated a return of 9.211% on its Executing Purchases at the artificially depressed price of \$0.76 per share. Defendant G1 EXECUTION SERVICES, LLC also sold 1,000 shares at a price of \$0.8202 per share at 11:45:58, prior to the Spoofing Episode, which generated a return of 7.921% if that sale created a short position that was closed out by the Executing Purchases at the artificially depressed price of \$0.76 per share.

e) VIRTU AMERICAS LLC

(1) Example Episode: May 10, 2022 – 12:19:03

255. On May 10, 2022 at 12:19:03, the best bid and offer for NWBO as calculated by Plaintiff based on publicly available data accessible to Plaintiff was a bid to purchase 2,000 shares at a price of \$0.64 per share and an offer to sell 6,741 shares at a price of \$0.6401 per share.⁵⁸

256. From 12:17:03 to 12:19:03, Defendant VIRTU AMERICAS LLC placed 15,000 shares of Baiting Orders at a price of \$0.65 per share. As of 12:19:03, the submission of these Baiting Orders left Defendant VIRTU AMERICAS LLC with an imbalanced order book position favoring the sell side consisting of bids to purchase 2,000 shares at a price of \$0.64 per share, and an offer to sell 16,000 shares at a price of \$0.65 per share.

257. Between 12:19:03 and 12:21:03, Defendant VIRTU AMERICAS LLC, based on

⁵⁸ The contemporaneous “inside quote” on OTC Link as of 12:19:02.776 was identical in price: a bid to purchase 3,000 shares at a price of \$0.64 per share and an offer to sell 30,081 shares at a price of \$0.6401 per share.

publicly available data accessible to Plaintiff, did not sell any shares of NWBO, which is consistent with the fictitious nature of the Baiting Orders. However, in order to ultimately convert profits from spoofing into cash, Defendant VIRTU AMERICAS LLC must sell NWBO shares that it acquired at artificially depressed prices. Accordingly, even if Defendant VIRTU AMERICAS LLC sold some NWBO shares during this episode, such sales would be consistent with Defendant VIRTU AMERICAS LLC's conversion of spoofing profits into cash.

258. Defendant VIRTU AMERICAS LLC parked these Baiting Orders behind orders placed by other unsuspecting traders. For example, when submitting the Baiting Orders, ASCENDIANT CAPITAL MARKETS, LLC had placed orders to sell 1,000 shares at prices as low as \$0.6401, a better price than some or all of the Baiting Orders placed by Defendant VIRTU AMERICAS LLC. Parking its Baiting Orders behind orders by other market participants like ASCENDIANT CAPITAL MARKETS, LLC is further evidence that Defendant VIRTU AMERICAS LLC was not engaging in legitimate market activity. Only 6% of the non-spoofed executed purchases that day had the purchaser previously park sell-side orders behind other market participants.

259. The Baiting Orders successfully induced the entry of sell orders from other market participants, driving the price of NWBO shares downward. At 12:19:03, Defendant VIRTU AMERICAS LLC took advantage of this artificial downward pressure and executed Executing Purchases to buy a total of 1,000 shares, at a price of \$0.64 per share, which was below the prevailing best offer of \$0.6401 per share.⁵⁹

260. Defendant VIRTU AMERICAS LLC began to cancel these Baiting Orders within 28.92 seconds. By 12:21:03, Defendant VIRTU AMERICAS LLC had cancelled all of its Baiting

⁵⁹ See footnote 4 above.

Orders, eliminating the artificial sell-side imbalance that had been falsely conveyed and injected into the market by Defendant VIRTU AMERICAS LLC. After cancelling the Baiting Orders, Defendant VIRTU AMERICAS LLC had an order book position on the over-the-counter markets consisting of bids to purchase 12,000 shares at a price of \$0.62 per share and offers to sell 1,000 shares at a price of \$0.6595 per share – dramatically reversing the position it had taken only moments before.

261. Defendant VIRTU AMERICAS LLC sold shares of NWBO both before and after this Spoofing Episode, which enabled it to convert profits from its spoofing activity to cash regardless of whether the Executing Purchases established a long position in NWBO or were used to close out a previously established short position. Specifically, Defendant VIRTU AMERICAS LLC sold 1,000 shares at a price of \$0.695 per share at 13:34:10, after the Spoofing Episode, which generated a return of 8.594% on its Executing Purchases at the artificially depressed price of \$0.64 per share. Defendant VIRTU AMERICAS LLC also sold 14,400 shares at a price of \$0.73 per share at 12:10:56, prior to the Spoofing Episode, which generated a return of 14.06% if that sale created a short position that was closed out by the Executing Purchases at the artificially depressed price of \$0.64 per share.

C. Defendants Intentionally Hid their Manipulative Spoofing Scheme

262. As described above, throughout the Relevant Period, each of the Defendants hid their manipulative spoofing scheme by, *inter alia*, deliberately “parking” fictitious Baiting Orders. Parking involves placing orders behind orders placed by other unsuspecting traders for some period of time.

263. By parking the Baiting Orders, Defendants ensured that those Baiting Orders were extraordinarily unlikely to be executed, and thus shows that Defendants never intended for their

Baiting Orders to be executed.

264. For example, on May 10, 2022 from 12:51:43 to 12:53:43, Defendant GTS SECURITIES LLC added **4,000** Baiting Orders to the sell side of the over-the-counter markets at a price of \$0.5985 per share. As of 12:53:43 the submission of these Baiting Orders left Defendant GTS SECURITIES LLC with an extremely imbalanced order book position favoring the sell side consisting of *no bids* and an offer to sell **5,000** shares at a price of \$0.57 per share.

265. Defendant GTS SECURITIES LLC parked these fictitious Baiting Orders behind orders placed by other unsuspecting traders; for example, CELADON FINANCIAL GROUP LLC had placed orders to sell 1,000 shares at prices as low as \$0.565, a better price than some or all of the Baiting Orders placed by Defendant GTS SECURITIES LLC during the two-minute period prior to the Executing Purchases. Thus, by parking its Baiting Orders behind CELADON FINANCIAL GROUP LLC orders, Defendant GTS SECURITIES LLC ensured that they were unlikely to ever be executed. These Baiting Orders were then cancelled once Defendant GTS SECURITIES LLC was able to execute its Executing Purchases at the artificial price created by those same Baiting Orders.

D. Defendants Acted with Scienter

266. Based on the alleged facts herein, Defendants acted with scienter. Defendants knowingly or with severe recklessness engaged in unlawful conduct intended to – and in fact did – deceive, manipulate, or defraud the market for NWBO shares and participants in that market, including Plaintiff.

267. First, each Defendant specifically designed and implemented algorithmic trading programs to execute their spoofing schemes. Their algorithms were programmed to, and did, generate trading patterns that involved the placement and cancellation of tens of millions Baiting

Orders to sell in the Limit Order Book and/or IQDS on OTC Link LLC and NYSE ARCA Global OTC that were never intended to be executed during the Relevant Period. Moreover, each Defendant – all of which are sophisticated entities which utilize cutting edge technology – closely monitored, modeled, and analyzed the performance, impact, and effects of their algorithmic trading program throughout the Relevant Period, including the spoofing pattern which the algorithm executed again and again on NWBO stock during the Relevant Period with similar effects each time.

268. Second, each Defendant’s trading activities were approved by corporate officials sufficiently knowledgeable about the trading practices of each Defendant such that each Defendant knew that they were engaging in illegal spoofing.

269. Third, as registered broker-dealers, Defendants knew and/or were required to know that it was unlawful to place Baiting Orders to sell in a Limit Order Book or IDQS that were never intended to be executed in order to trick market participants into selling shares of NWBO stock.

270. Fourth, as registered broker-dealers, Defendants were required, pursuant to FINRA Rule 2020, to have internal policies, procedures and systems that detected and prohibited manipulative or fraudulent trading devices or schemes. As registered broker-dealers, Defendants were also required, pursuant to FINRA Rules 5210, Supplementary Material .02; Rule 1220 and Exchange Rule 575, Disruptive Practices Prohibited, to detect and prevent manipulative or fraudulent trading that originated from algorithmic high-speed trading under the supervision and control of their firm. Indeed, during the Relevant Period each Defendant filed an “Annual Certification of Compliance and Supervisory Processes,” pursuant to FINRA Report 3130, in which they confirmed that they:

(A) establish[ed], maintain[ed] and review[ed] policies and procedures reasonably designed to achieve compliance with applicable FINRA rules,

Municipal Securities Rulemaking Board (“MSRB”) rules and federal securities laws and regulations; (B) modif[ied] such policies and procedures as business, regulatory and legislative changes and events dictate; and (C) test[ed] the effectiveness of such policies and procedures on a periodic basis, the timing and extent of which is reasonably designed to ensure continuing compliance with FINRA rules, MSRB rules and federal securities laws and regulations.

271. Notably, at least as early as 2015, Defendant CITADEL developed an algorithm that it called a “pull swipe detector” to identify and compile evidence of spoofing by other market participants. Despite developing a system to identify spoofing violations years prior to the Relevant Period, Defendant CITADEL either intentionally ignored the results of that system or failed to effectively use that or any other system to detect and prevent its own illegal spoofing conduct.

272. Given Defendants’ obligation and ability to monitor, detect, and prevent manipulative or fraudulent trading and their FINRA Report 3130s in which they stated that they did, in fact, do so, Defendants either intentionally manipulated the market through their spoofing scheme, or were highly reckless in allowing such behavior to occur.

273. Fifth, as set forth above, each of the Defendants has a history of violating various securities laws, including, among other things, having been found by various financial regulators to have improperly manipulated or failed to prevent the manipulation of stock prices.

274. Sixth, Defendants regularly and intentionally “parked” fictitious Baiting Orders behind orders placed by other unsuspecting traders – which meant they were extraordinarily unlikely to be executed – in order to hide their spoofing scheme. While “parking” Baiting Orders need not always accompany Spoofing Episodes – because the price impact of Baiting Orders is greater the more aggressively priced they are – parking such Baiting Orders is further evidence that Defendants did not intend for its orders to be filled, and knew that it was placing the orders as a manipulative technique and was not engaging in legitimate market activity.

275. Seventh, Defendants' Baiting Orders frequently left Defendants with an imbalanced order book position favoring the sell side. Despite these imbalanced order book positions, Defendants often did not sell *any* shares of NWBO after posting Baiting Orders. This is consistent with the fictitious nature of the Baiting Orders, and indicates that Defendants never intended to execute any of its numerous Baiting Orders; instead, Defendants placed the Baiting Orders in order to create artificial selling pressure and induce other market participants to submit additional sell orders, and thus artificially drive down the price of NWBO shares. This behavior is contrary to the behavior of an ordinary trader who buys when it thinks the price of a security is likely to go higher and sells when it thinks the price of a security will go lower, and thus rarely, if ever, develops such an imbalance that never gets executed.

276. Eighth, the short time period between the placement and cancellation of their Baiting Orders is further indicative of scienter. During each Spoofing Episode, Defendants placed and then cancelled the Baiting Orders within one to two minutes, and at times seconds and even milliseconds. This practice, which occurred thousands of times over the Relevant Period, indicates that Defendants never intended to execute the Baiting Orders.

277. Ninth, the concentration of cancelled Baiting Orders during the limited period when each spoofing event occurred is also indicative of scienter. During each Spoofing Episode, Defendants cancelled all of the Baiting Orders, sometimes amounting to tens of thousands of Baiting Orders, in a matter of seconds and sometimes milliseconds, all of which had been placed by Defendants at most mere minutes earlier.

278. Tenth, as demonstrated in the chart below, the size of the Baiting Orders that were cancelled, in comparison to the size of *bona fide* sell-side orders that were executed by each Defendant is also indicative of scienter. During each Spoofing Episode, Defendants placed and

subsequently cancelled a median of 4,500 shares in Baiting Orders while, according to available data, executing a median of zero executed sell-side orders. The stark contrast between the share volume of Baiting Orders and executed sell-side orders during each Spoofing Episode is additional and further indication that Defendants were manipulating the market by using Baiting Orders as tools to generate artificial prices, rather than making a genuine attempt to sell NWBO shares.

279. Eleventh, as demonstrated in the chart below, the ratio of each Defendant's cancelled Baiting Orders compared to each Defendant's executed *bona fide* orders to sell is also indicative of scienter. In the median Spoofing Episode, Defendants placed and subsequently cancelled 4,500 sell-side shares in Baiting Orders while, according to data available to Plaintiff, they executed zero sell-side orders. An extremely high sell-side cancellation rate, such as the 100% here, is a strong indication that Defendants never intended to execute those Baiting Orders. The following table breaks down these figures by each Individual Defendant:

Defendant	Median Volume of Baiting Orders	Median Volume of Executed Sales	Cancellation Rate
CITADEL SECURITIES LLC	9,950	0	100%
CANACCORD GENUITY LLC	16,879	0	100%
G1 EXECUTION SERVICES, LLC	9,100	0	100%
GTS SECURITIES LLC	10,043	0	100%
INSTINET, LLC	2,035	0	100%
LIME TRADING CORP.	3,000	625	79%
VIRTU AMERICAS LLC	8,100	0	100%

280. Twelfth, as demonstrated in the chart below, the size of executed sell-side orders compared to Executing Purchases by each Defendant is also indicative of scienter. In the median Spoofing Episode, Defendants executed 2,000 shares in Executing Purchases, while in contrast Defendants did not execute *any* sell-side orders. The stark contrast between the share volume of

each Defendant's Executing Purchases and each Defendant's sell-side orders is additional and further indication that Defendants were manipulating the market by using Baiting Orders as tools to generate artificial prices at which to place Executing Purchases at favorable prices.

281. Thirteenth, as demonstrated in the chart below, the ratio of executed sell-side orders compared to Executing Purchases by each Defendant is thus also indicative of scienter. In the median Spoofing Episode, Defendants executed 2,000 shares of Executing Purchases while, according to available data, not executing any sell-side orders. A lopsided ratio, such as 2,000-to-0 as here, is additional and further indication that Defendants never intended to execute their Baiting Orders to sell. The following table breaks down these figures by each Individual Defendant:

Defendant	Median Volume of Executing Purchases	Median Volume of Executed Sales
CITADEL SECURITIES LLC	3,648	0
CANACCORD GENUITY LLC	1,600	0
G1 EXECUTION SERVICES, LLC	5,000	0
GTS SECURITIES LLC	2,795	0
INSTINET, LLC	1,000	0
LIME TRADING CORP.	3,000	625
VIRTU AMERICAS LLC	2,025	0

282. Fourteenth, Defendants carried out thousands of Spoofing Episodes over the Relevant Period, and often multiple episodes per trading day. The repetition of this pattern of placing fictitious Baiting Orders which create an artificial price, Executing Purchases at the artificial price, and then cancelling all of the Baiting Orders, is indicative of scienter.

283. Fifteenth, Defendants' behavior was inconsistent with *bona fide* market making. Over Baiting Periods, Defendants posted a median of 149% more new sell-side orders than new buy-side orders. Over Cancellation Periods, Defendants cancelled a median of 100% of the sell-

side orders created during Baiting Periods, but only a median of 71% of the buy-side orders created during Baiting Periods. This asymmetry in the posting of new orders and order cancellation rates is inconsistent with *bona fide* market making, which involve purchases and sales in roughly comparable amounts to provide liquidity to customers or other broker-dealers while remaining roughly market neutral. The following table lists these figures by each Individual Defendant:

Defendant	Median New Sell Orders to Buy Orders	Median Sell-Side Cancellation Rate	Median Buy-Side Cancellation Rate
CITADEL SECURITIES LLC	145%	100%	70%
CANACCORD GENUITY LLC	84%	100%	75%
G1 EXECUTION SERVICES, LLC	116%	98%	56%
GTS SECURITIES LLC	138%	85%	65%
INSTINET, LLC	209%	100%	67%
LIME TRADING CORP.	100%	100%	100%
VIRTU AMERICAS LLC	169%	100%	65%

284. These cancellation rates are vastly different among other market participants. For example, when considering purchases similar to Defendants' Executing Purchases during Spoofing Episodes – *i.e.*, those preceded by volume of subsequently cancelled sell-side orders exceeding the median volume among the Defendants' Spoofing Episodes – other market participants had symmetrical median order cancellation rates of 100% sell-side and 100% buy-side orders. When considering every Executing Purchase, other market participants cancelled 100% of buy-side orders but only 66.7% of sell-side orders. And when limiting to Executing Purchases preceded by *both* newly created sell-side and buy-side orders and followed by *both* cancelled sell-side and buy-side orders,⁶⁰ other market participants had symmetrical median

⁶⁰ By requiring both the creation of sell-side *and* buy-side new orders prior to an Executing Purchase, and the cancellation of both types of orders following an Executing Purchase, this condition ensures that there is *some* order flow to compare to, without skewing the comparison toward either the sell side or buy side.

cancellation rates of 100% sell-side and 100% buy-side orders. None of these cancellation rates are skewed to the sell side like those of Defendants.

285. Finally, there is an extremely low statistical likelihood that the price variations for each of the Spoofing Episodes occurred naturally. The market impact of these Spoofing Episodes was material and statistically significant.

286. In addition, Defendants had a strong motive to spoof the shares of NWBO stock and engage in their manipulative scheme. By manipulating down the share price of NWBO, Defendants were able to make at least hundreds of millions in aggregate profits by purchasing hundreds of millions of shares of NWBO at artificially depressed prices.

287. This strong motive also existed even when Defendants were executing trades on behalf of clients. Defendants obtain commissions, fees, or other forms of compensation for acting as a broker for client trades. Accordingly, Defendants have a financial incentive to spoof NWBO shares in order to execute client trades at artificially favorable prices and thereby gain or retain the trading business of brokerage clients.

VI. LOSS CAUSATION AND STANDING

288. During the Relevant Period, Defendants engaged in spoofing NWBO on 395 of 1,171 – or more than a third – of all trading days. Plaintiff sold over 274 million shares of stock in hundreds of distinct transactions at share prices artificially depressed by this manipulative spoofing. *See* Exhibit 2. Defendants’ manipulation of NWBO’s share price caused NWBO to receive less in consideration for its sale of shares than it would have if the secondary market trading price reflected the true, unmanipulated price for NWBO stock, and as a result, Plaintiff was directly and proximately harmed by Defendants.

289. Of Plaintiff’s over 274 million shares of stock sold during the Relevant Period,

more than 40 million shares were sold by Plaintiff where the sale price was formulaically determined from the closing price on dates where Spoofing Episodes occurred, such that a decline in the price on that day caused a decline in the price at which Plaintiff sold shares of NWBO stock.⁶¹ *See* Exhibit 3.⁶² These sales took two forms: Cash Stock Sales and Exchange Agreement Sales.

Cash Stock Sales

290. In Cash Stock Sales, Plaintiff sold shares in transactions that were executed at the secondary market closing price on a single given date (a “Pricing Date”) or at a price equal to the average secondary market closing price of NWBO’s shares over one or more Pricing Dates. Because a decline in any component of an average mathematically leads to a decline in the average, a decline in the closing price of NWBO’s shares on the days included in that average led to a decline in the price at which Plaintiff sold shares of stock.

291. For example, on October 12, 2020, Plaintiff entered into financings totaling approximately \$11.9 million. Approximately \$10 million of that financing came from an offering of approximately 12.2 million shares of newly-registered common stock (with 30% warrants coverage) at \$0.816 per share based upon the average 10-day closing price ending on October 12, 2020.

292. The price for the Cash Stock Sales made on October 12, 2020, pursuant to the offering was explicitly set *equal to* the average of the closing price on a series of trading dates,

⁶¹ As set forth further below, the sales made by Plaintiff where the sale price was not formulaically determined from the closing price on dates where Spoofing Episodes occurred – which total approximately 234 million shares of stock sold – were negatively impacted due to the long-term price impact of Defendants’ spoofing.

⁶² Exhibits 4-7 include the same transactions listed in Exhibit 3, but provide further information regarding those transactions.

which include seven trading days (September 29 and 30, 2020 and October 1, 6, 8, 9, and 12, 2020) on which Defendants engaged in spoofing. Had Defendants' spoofing not artificially lowered NWBO's closing price on any one of those seven trading days, the average 10-day closing price ending on October 12, 2020, would have necessarily been higher, and thereby the sale price for the Cash Stock Sales taking place on October 12, 2020, necessarily would have been higher.

293. Similarly, on December 12, 2021, Plaintiff sold 1,916,667 shares of stock in three distinct Cash Stock Sales: one sale of 666,667 shares; a second sale of 1,000,000 shares; and a third sale of 250,000 shares. These transactions were effectuated through stock purchase agreements dated Sunday, December 12, 2021. Plaintiff agreed to sell these shares at the closing price on Friday, December 10, 2021, which was \$0.60 per share. On Friday, December 10, 2021, there were five distinct Spoofing Episodes from 3pm-4pm. Had these Spoofing Episodes not artificially lowered NWBO's closing price on December 10, 2021, the sale price for these Cash Stock Sales on December 12, 2021, necessarily would have been higher.

294. Attached as Exhibit 4 is a chart containing Plaintiff's Cash Stock Sales in which the sale price was determined by the closing price of NWBO shares on one or more Pricing Dates having one or more Spoofing Episodes in the final hour of a trading day (*i.e.*, between 3pm – 4pm). There were forty-four (44) such transactions, across which a total of 14,141,632 shares were sold at artificially depressed prices.

295. Attached as Exhibit 5 is a chart containing Plaintiff's Cash Stock Sales in which the sale price was determined by the closing price of NWBO shares on one or more Pricing Dates having one or more Spoofing Episodes between one hour and twenty-four hours before the close of trading on the Pricing Date. There were three (3) such transactions, across which a total of 1,113,623 shares were sold at artificially depressed prices.

296. The remainder of NWBO's Cash Stock Sales during the Relevant Period were sold at artificially depressed prices due to the long-term adverse effect of Defendants' spoofing. While these sale prices were based on Pricing Date(s) that took place more than 24 hours after a Spoofing Episode, many of the Pricing Date(s) after which one or more Spoofing Episodes occurred were within the window specified by the formula for calculating the sale price of Plaintiff's sales.

Exchange Agreement Sales

297. In Exchange Agreement Sales, Plaintiff sold shares to lenders in exchange for the extinguishment of debt obligations having an outstanding value equal to the market value of Plaintiff's shares as determined by a standard pricing formula. In these transactions, the price at which Plaintiff sold shares to lenders was determined by a single formula: (a) 85% multiplied by (b) the average of the five lowest closing sale prices of NWBO shares in the last twenty trading days immediately preceding the date of each exchange agreement. Because a decline in any component of an average mathematically leads to a decline in the average, a decline in the closing price of NWBO's shares on the days included in that average led to a decline in the price at which Plaintiff sold shares of stock.

298. For example, on January 11, 2018, Plaintiff entered into an exchange agreement (the "Exchange Agreement") with a lender counterparty (the "Lender-Purchaser"). In the Exchange Agreement, Plaintiff and the Lender-Purchaser agreed to partition, *i.e.*, remove and deduct \$107,956.82, in the form of a new note, from the current obligation in exchange for 562,225 shares of common stock at a sale price ("Market Price") defined in the exchange agreement as "(a) 85% multiplied by (b) the average of the five (5) lowest closing sale prices of the Common Stock (as reported by Bloomberg L.P.) in the last twenty (20) trading days immediately preceding the date of this Agreement."

299. On one of the twenty trading days immediately preceding the date of the Exchange Agreement, December 19, 2017, there was a Spoofing Episode within one hour of the close of trading (*i.e.*, between 3pm and 4pm), as well as another Spoofing Episode within twenty-four hours of the close of trading. Because the closing price on December 19, 2017 – \$0.2202 – was one of the five lowest closing prices of the twenty trading days immediately prior to the execution of the Exchange Agreement, the closing price on December 19, 2017, determined the price at which NWBO sold shares in the Exchange Agreement on January 11, 2018: \$0.1920170 per share. That sale price was 85% of the average of those five lowest closing prices in that twenty day look-back period (\$0.2259020). Had Spoofing Episodes not artificially lowered NWBO’s closing price on December 19, 2017, the sale price for these Exchange Agreement Sales on January 11, 2018, necessarily would have been higher.⁶³

300. Attached as Exhibit 6 is a chart containing Plaintiff’s Exchange Agreement Sales in which the sale price was determined by the closing price of NWBO shares on dates where one or more Spoofing Episodes took place in the final hour of trading on the Pricing Date (*i.e.*, between 3pm – 4pm). There were twenty-three (23) such transactions, across which a total of 8,379,501

⁶³ In certain instances, the terms of an Exchange Agreement Sale provided that Plaintiff would sell additional shares of stock to the purchaser if the share price of NWBO declined following the date of the Exchange Agreement. These so-called “true-up” provisions always applied the same formula: a “true-up” price would be calculated as 85% of the average of those five lowest closing prices in the twenty trading days *following* the date of the Exchange Agreement. If the “true-up” price was below the original sale price, Plaintiff would sell additional shares to adjust the final price paid by the purchaser for the entire transaction. For any Exchange Agreement Sale where true-up shares were issued (*i.e.*, where the true-up price was below the original sale price), Spoofing Episodes on the pricing dates used to calculate the true-up price would cause Plaintiff to sell shares at a lower price than would otherwise have occurred absent the spoofing. For this reason, transactions in Exhibits 6 and 7 sometimes include Pricing Dates *after* the transaction date which had Spoofing Episodes within 1 hour or within 24 hours, respectively, before the close of trading on those Pricing Dates. Those Spoofing Episodes led to the sale of additional shares pursuant to true-up provisions at a sale price that was artificially depressed by spoofing activity on those true-up Pricing Dates.

shares were sold at artificially depressed prices.

301. Attached as Exhibit 7 is a chart containing Plaintiff's Exchange Agreement Sales in which the sale price was determined by the closing price of NWBO shares on dates where the closing price was affected by one or more Spoofing Episodes that took place between one hour and twenty-four hours before the close of trading on the Pricing Date. There were twenty-five (25) such transactions, across which a total of 16,872,872 shares were sold at artificially depressed prices.

302. The remainder of NWBO's Exchange Agreement Sales during the Relevant Period were sold at artificially depressed prices due to the long-term adverse effect of Defendants' spoofing. While these sale prices were based on Pricing Date(s) that took place more than 24 hours after a Spoofing Episode, many of the Pricing Date(s) after which one or more Spoofing Episodes occurred were within the window specified by the formula for calculating the sale price of Plaintiff's sales.

303. Defendants' manipulative trading conduct had both a temporary and long-term adverse effect on the price of all of Plaintiff's sales, regardless of type, during the Relevant Period.

304. First, Defendants' spoofing caused an immediate decline in the price of NWBO shares, which did not fully reverse over time. Instead, the price decline caused by Defendants' spoofing stabilized at a depressed level relative to the price that would have existed absent Defendants' spoofing, resulting in an immediate and sustained negative price impact that harmed Plaintiff when it sold its shares.

305. For example, on Sunday, December 12, 2021, Plaintiff sold approximately 1.9 million shares at a price equal to the closing price of NWBO stock on Friday, December 10, 2021, or \$0.60. That day, NWBO's share price fell from an opening price of \$0.74 per share to close at

\$0.60 per share – a decline of 18.9%. By comparison, the S&P 500 reached a record high that day, and the OTCQB index (where NWBO is listed) declined only 0.50%. There was no negative news issued that day regarding NWBO. By all accounts, the decline in the price of NWBO shares on December 10, 2021, was unusual and extraordinary in magnitude.

306. The majority of the decline in the price of NWBO shares on December 10, 2021, occurred from 15:00:00 to 16:00:00, during which the share price declined 12%. All five Spoofing Episodes in NWBO's shares that day occurred in the final hour of trading, beginning at 15:00:04 and ending at 15:52:49 – *minutes prior to the close of trading*. But for Defendants' unlawful spoofing activity, the price of NWBO shares would not have declined by 12% during that time period, and Plaintiff would have sold shares at a price higher than \$0.60 per share.

307. The 68 transactions marked in Exhibit 3 with a double asterisk (**) are those where a Spoofing Episode occurred within one hour of the close of the trading day on a Pricing Date, and the additional 27 transactions marked in Exhibit 3 with only a single asterisk (*) are those where a Spoofing Episode occurred between one hour and 24 hours of the close of the trading day on a Pricing Date. In total, Plaintiff sold 40,507,628 shares in 95 transactions within 24 hours after Defendants' Spoofing.

308. Second, the impact of Defendants' spoofing activity also extended beyond the specific spoofing cycle (*i.e.*, orders, trades, and cancellations), because the market neither immediately nor fully rebounded from the manipulated prices once each of the Spoofing Episodes was completed.

309. When spoofing events occur continuously throughout the day and continue without interruption over a protracted period of time, it can have a long-term impact on the price of a stock. Here, Defendants engaged in at least 2,849 Spoofing Episodes on at least a third of the trading

days during the Relevant Period. The cumulative effect of Defendants' sustained spoofing placed enormous downward pressure on the market price of NWBO shares, which was persistent and long-lasting.⁶⁴

310. Because the price impact of Defendants' spoofing activity was not limited to the time period immediately following each individual Spoofing Episode, the prices at which Plaintiff sold all of its stock throughout the Relevant Period were negatively affected by Defendants' spoofing that occurred prior to Plaintiff's sales, regardless of whether those Spoofing Episodes occurred on a Pricing Date. As such, all of Plaintiff's sales listed in Exhibit 2 were sold at artificially depressed prices.

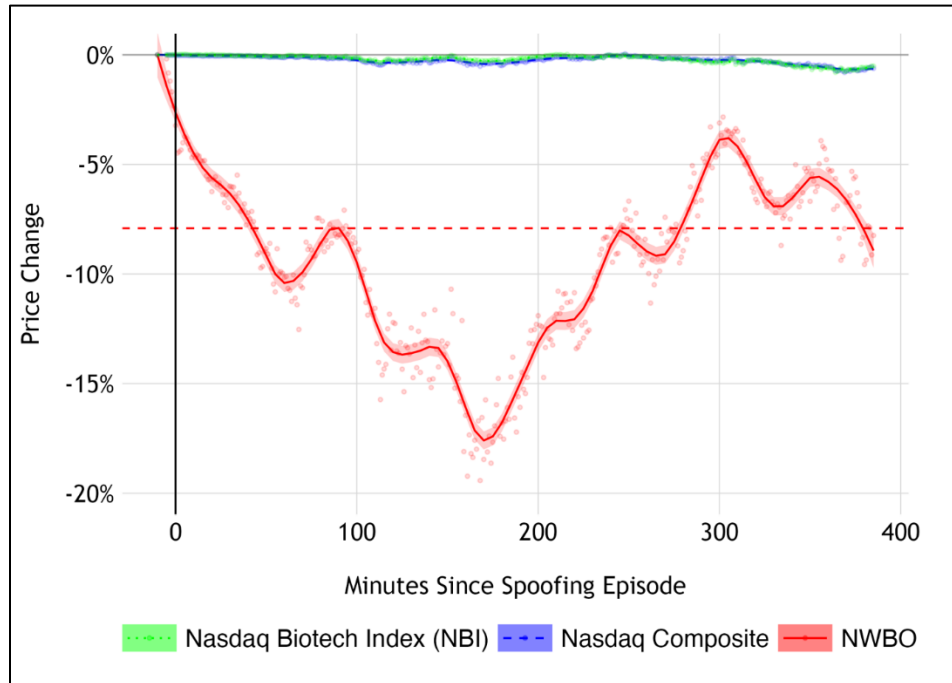
311. The following figure shows the average price impact of Spoofing Episodes over the minutes following each Spoofing Episode. The figure also shows the average price changes in the Nasdaq Composite Index (NASX) and in the Nasdaq Biotechnology Index (NBI)⁶⁵, which further demonstrate that the negative average price impact on NWBO was the result of Defendants' spoofing rather than of market-wide conditions⁶⁶ (95% confidence intervals are illustrated by the

⁶⁴ Whether the prevailing market sentiment towards NWBO at any particular moment was trending in a positive or negative direction does not alter the fact that the Defendants' spoofing caused a negative impact on the price of NWBO shares, depressing the price from what it would have been in an unmanipulated market. Whether the market was reacting at any particular instant to positive or negative news regarding NWBO, the market price of its stock was lower than it would have been throughout the Relevant Period absent Defendants' manipulative conduct.

⁶⁵ NASX and NBI are standard and appropriate benchmarks for NWBO. A regression of NWBO's daily returns (percentage price changes) on the daily returns of NASX and on the daily returns of NBI yields positive and statistically significant coefficients of 0.4302267 ($p = 0.0000321$) and 0.441807 ($p = 0.00000133$), respectively.

⁶⁶ Because the Spoofing Episodes occurred at short, discrete intervals in time, news about NWBO or other firm-specific events cannot explain these price declines. For the price decline following Spoofing Episodes to be driven by these events, the event would need to occur at exactly the same time as the Spoofing Episodes. But these events are not occurring at the same time as Spoofing

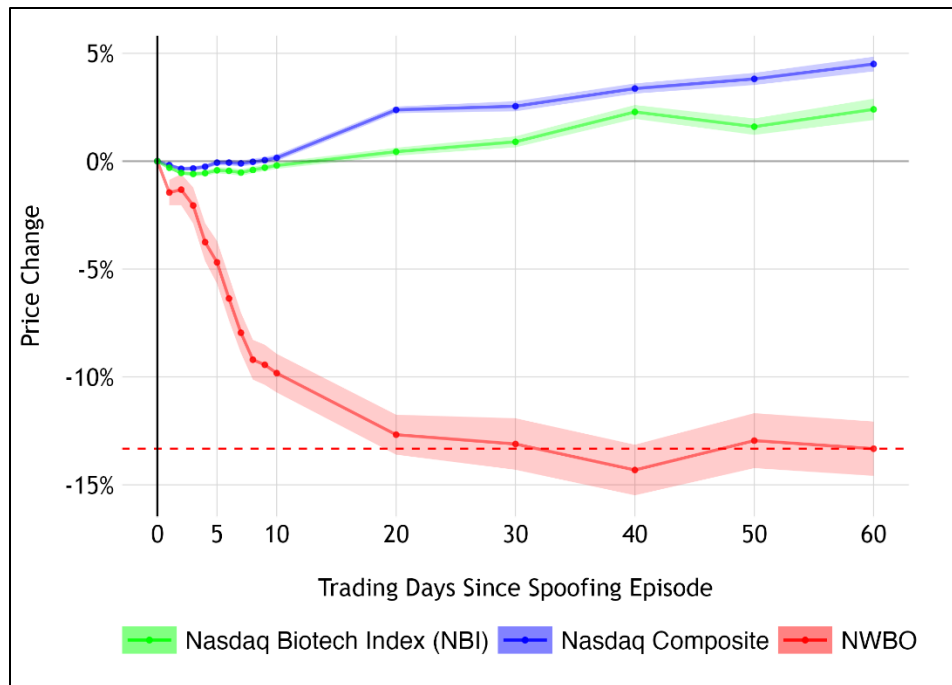
shaded regions around the solid lines.)



312. As the above figure shows, the periods after Spoofing Episodes were characterized by a price decline followed by a *partial* reversion that provided Defendants an opportunity to profit from their purchases (including Executing Purchases) at depressed prices. Following the *partial* reversion, NWBO's share price stabilized, but at a *still depressed* level.

313. The sustained, repetitive, and continuous stream of Defendants' spoofing had a persistent long-term negative impact on the price of NWBO shares. The following figure shows the average change in NWBO's share price from the 2 minutes prior to Spoofing Episodes to the trading days thereafter, as well as the average changes in the NASX and NBI over the same periods (95% confidence intervals are illustrated by the shaded regions around the solid lines.)

Episodes. Thus, the price impact of those events is incorporated into the price of NWBO shares at a different point in time—either long before the Spoofing Episodes or long after, but not at the exact moment of those Spoofing Episodes.



314. As the above figure shows, the negative price impact of Spoofing Episodes persisted up to sixty (60) trading days following the Spoofing Episodes, during times when both NASX and NBI were increasing in value. After twenty (20) days, NWBO's price decline stabilized, but persisted at a depressed price and did not revert in the following trading days.

315. The stabilization of the decline in the price of NWBO shares from between twenty (20) to sixty (60) trading days after the Spoofing Episodes makes clear that the decline was not driven by negative news affecting the price of NWBO shares during the Relevant Period, because such news would have continued to cause a further price decline on the dates following Spoofing Episodes.

316. As Nobel prize winning economist Professor Paul Milgrom explains, this price decline persists "[b]ecause manipulative trades are viewed by market participants as potentially informed, and potentially informed trades can result in permanent price impact, [therefore] manipulative trades can lead to permanent price impact." *See supra* ¶ 60 (the Milgrom Report is

attached as Exhibit 8).⁶⁷

317. The Milgrom Report discusses the extensive economic literature establishing that the price impact of *all* forms of trade-based manipulation, including spoofing, is not likely to fully reverse. The price impact of spoofing does not fully reverse for two reasons. First, peer-reviewed research demonstrates that order cancellations drive the price *up* by *less* than new orders drive the price *down*.⁶⁸ For this reason, the impact of Baiting Orders is not likely to dissipate merely because those orders were subsequently cancelled. Second, manipulative spoofing causes the execution of “*trades*,” not only the placement of orders, because Baiting Orders induce other market participants to sell shares at artificially depressed transaction prices.

318. The economic literature recognizes that in modern securities markets, every transaction occurs between a *liquidity maker* and a *liquidity taker*.⁶⁹ The term “liquidity maker” refers to the party who places an order to buy or sell shares that is *non-marketable*. A “non-marketable” order has a price that is too low (for a purchase) or too high (for a sale), relative to the current willingness of other market participants to transact. For example, suppose the last trading price of a security was \$9.99 and the best bid—*i.e.*, the highest price that buyers are willing

⁶⁷ See Basil Williams & Andrzej Skrzypacz, *Spoofing in Equilibrium*, at 3 (Feb. 2021), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3742327 (disagreeing that spoofing is “an out-of-equilibrium phenomenon that can be completely neutralized by sophisticated traders once understood by all market participants”).

⁶⁸ Jonathan Brogaard, Terrence Hendershott & Ryan Riordan, *Price Discovery without Trading: Evidence from Limit Orders* 74 J. FIN. 1583, 1635 (2019) (magnitude of price impact of order placement exceeds magnitude of price impact of order cancel).

⁶⁹ Yong Chao, Chen Yao & Mao Ye, *Discrete Pricing and Market Fragmentation: A Tale of Two-Sided Markets*, 105 AM. ECON. REV. PAP. & PROC. 196 (2017) (“A trader can act as a liquidity maker by posting a limit order with a specified price and quantity. A trade occurs when a liquidity taker accepts the terms of a limit order.”). While this literature refers to limit orders, the conclusions apply equally to an IDQS like OTC Link, where the posted quote functions equivalently to a limit order.

to pay—is \$9.98 and the best offer—*i.e.*, the lowest price that sellers are willing to accept—is \$10.00 per share. If a market participant places a buy order at a price of \$9.99 (or less) per share, that order will be ***non-marketable*** because there is no seller who is willing to sell at \$9.99 per share at that point in time. That buy order will, however, remain in the Limit Order Book, ready to transact with a seller who is willing to sell shares at a price of \$9.99 (or less) per share.

319. By contrast, the term “liquidity taker” refers to the party who places an order to buy or sell shares that is ***marketable***. A “marketable” order has a price that is high enough (for a purchase) or low enough (for a sale), relative to the current willingness of other market participants to transact. Returning to the prior example, a buy order at a price of \$10.00 (or more) per share would be a marketable order because a market participant had previously submitted an existing sell order at a price of \$10.00 per share. Every transaction in the market occurs between a marketable and a non-marketable order, but prices generally move in the direction of marketable orders. In the preceding example, a marketable buy order at \$10.00 per share would execute against a non-marketable sell order at \$10.00 per share, causing the price to increase from \$9.99 to \$10.00 per share.⁷⁰

320. ***Every Executing Purchase*** identified in this Complaint consists of a non-marketable buy order executing against a marketable sell order by another market participant,

⁷⁰ In general, non-marketable buy and sell orders typically are placed on either side of the last transaction price. Thus, if the last transaction price was \$9.99 (as in this example), a non-marketable buy order typically would be placed at \$9.98 (or less) and a non-marketable sell order typically would be placed at \$10.00 (or more). *See, e.g.*, Lawrence R. Glosten & Paul R. Milgrom, *Bid, Ask and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders*, 14 J. FIN. ECON. 71 (1985) (deriving bid/ask spread). Transaction prices generally move in the direction of marketable orders because marketable buy (or sell) orders execute against non-marketable sell (or buy) orders which are above (or below) the previous transaction price.

leading to a decline in NWBO's share price.⁷¹ For this reason, Executing Purchases reflect the execution of aggressively priced sell orders which were induced by the Baiting Orders. Accordingly, the spoofing activity identified in this Complaint consists of *trade-based manipulation* whereby Baiting Orders induced market participants to place marketable sell orders that executed against Defendants' non-marketable Executing Purchases. *Supra* ¶¶ 74, 76, 87, 90, 101, 104, 115, 118, 129, 132, 143, 146, 157, 160, 170, 173, 183, 190, 193, 204, 207, 217, 220, 231, 238, 245, 252, 259.

321. The placement of non-marketable buy orders after the completion of a Spoofing Episode induced only a ***partial price reversion*** that did not fully unwind the impact of Defendants' manipulative spoofing. Therefore, prices of NWBO stock did not fully revert to the market level, even though these partial price reversions provided Defendants an opportunity to profit from buying additional NWBO shares.

322. Because the price of NWBO shares may have been higher or lower after any single Spoofing Episode for reasons that would have occurred absent Defendants' spoofing—such as increasing investor enthusiasm—the price impact of Defendants' spoofing activity is not measured by what happened to the stock price in a given instance, but by the average price impact over those episodes, as shown *supra* ¶ 311. Otherwise, the determination of whether spoofing affected the price would be confounded by factors, like increasing investor enthusiasm, that would have occurred even if no spoofing had occurred at all.

⁷¹ On OTC Link, quotes placed by the Defendants are non-marketable by definition. The identification of Executing Purchases based on matching to quote changes reflects the execution of non-marketable orders by the Defendants. On Global OTC, to avoid double-counting, only non-marketable limit orders are included in the data—the marketable side of the order is simply reflected as an execution of the non-marketable order included in the data. The execution of limit orders by the Defendants on Global OTC, as alleged in this Complaint, thus reflects the execution of non-marketable orders by definition.

323. Indeed, on days when the price rose after a Spoofing Episode, data demonstrates that this price increase would have occurred even absent Defendant's spoofing. Defendants' manipulative spoofing often occurred during periods when there was increasing investor enthusiasm concerning NWBO's share price. Plaintiff examined posts concerning NWBO on the popular message board platform InvestorsHub.⁷² This message board is popular among investors in small-cap and over-the-counter stocks, including NWBO, and the U.S. Department of Justice and Securities and Exchange Commission have alleged that posts on InvestorsHub are material for OTC stocks. Information, *U.S. v. Nielsen*, No. 5:22-cr-00161-BLF (N.D. Cal., Apr. 18, 2022) (attached as Exhibit 9); Complaint, *SEC v. Nielsen*, No. 5:20-cv-03788 (N.D. Cal. Jun 09, 2020) (attached as Exhibit 10).⁷³

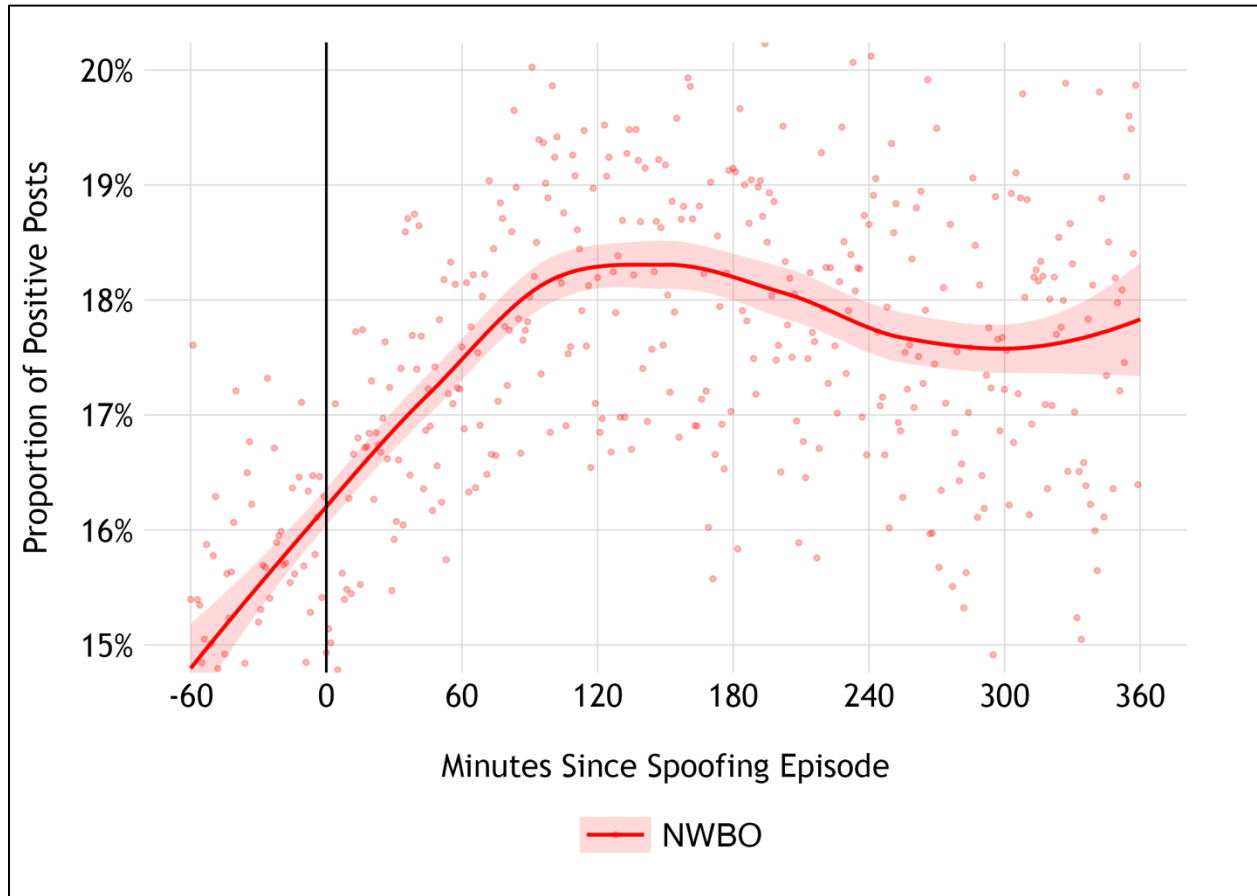
324. To measure investor enthusiasm, Plaintiff downloaded all 235,194 posts during the Relevant Period on the NWBO message board on InvestorsHub, and applied standard sentiment analysis, which scores the message board post according to standard methods employed in the peer-reviewed literature.⁷⁴ The following figure shows the proportion of positive (*i.e.*,

⁷² <https://investorshub.advn.com/NorthWest-Biotherapeutics-Inc-3441>.

⁷³ In the *Nielsen* criminal case, the defendant pled guilty, and the civil case has been subject to ongoing stays.

⁷⁴ Plaintiff employed sentiment analysis using the so-called "Loughran-McDonald dictionary," which is named after a seminal paper published in the *Journal of Finance* that has been cited more than 5,330 times (as of March 6, 2024). Tim Loughran & Bill McDonald, *When is a Liability not a Liability? Textual Analysis, Dictionaries, and 10-Ks*, 66 J. FIN. 35 (2011). Following the peer-reviewed literature, Plaintiff applied standard methods like word stemming and stopwords removal to score the sentiment for each word in the message board post. *See, e.g.*, JUSTIN GRIMMER, MARGARET E. ROBERTS & BRANDON M. STEWART, *TEXT AS DATA: A NEW FRAMEWORK FOR MACHINE LEARNING AND THE SOCIAL SCIENCES* 49 PRINCETON UNIVERSITY PRESS, (2022). These scores are then averaged into a single sentiment score for each post, and a post is classified as positive if it has a sentiment score above zero.

enthusiastic) posts about NWBO in the minutes prior to and following Spoofing Episodes⁷⁵:



325. As the above figure shows, Defendants tended to engage in Spoofing Episodes during periods of time when investor enthusiasm over NWBO was rising.⁷⁶ This evidence demonstrates that, absent Defendants’ spoofing, the price of NWBO shares would have increased following the Spoofing Episodes. This evidence also demonstrates that Spoofing Episodes “cut off” investor enthusiasm, preventing NWBO’s share price from rising even further. For this reason,

⁷⁵ For example, if there were a total of 10,000 posts in the third minute after all the Spoofing Episodes in this Complaint, and 1,500 of those were positive, the proportion of positive (*i.e.*, enthusiastic) posts for that minute would be $1,500 / 10,000 = 15\%$.

⁷⁶ Investor enthusiasm, as measured by the proportion of positive sentiment posts, is positively correlated with changes in the intraday price of NWBO shares, and that correlation is statistically significant at the $p < .0001$ level.

increases in the price of NWBO shares do not reflect that the price impact of Defendants' spoofing had dissipated fully. Whether NWBO's share price increased or decreased following the Spoofing Episode, but for Defendants' manipulative conduct, the price of NWBO shares *would have been even higher*.

326. Moreover, the Milgrom Report explains that manipulative trading like spoofing can cause a permanent price impact to persist even after the manipulative trades are "unwound" through subsequent trades to realize profits. This is because of asymmetry in the nature of the manipulative trades and the nature of the unwinding trades:

There is, however, no symmetry in the manipulative trade and its unwinding. A manipulative trader who wants, for example, to raise a price will buy in a way that maximizes the price impact. However, when unwinding the trade, that same trader will seek to minimize the price impact to avoid losses. Therefore, the upward effect can be expected to exceed the downward effect from unwinding—and that difference may represent a permanent effect.

327. Defendants engaged in asymmetric behavior that yielded an asymmetric price impact between manipulative Spoofing Episodes and the unwinding of their manipulative conduct. The total share volume of sell-side Baiting Orders exceeded the share volume of buy-side Executing Purchases by over 57%. *Supra* ¶¶ 65, 67 (30.4 million shares of Baiting Orders to 19.3 million shares of Executing Purchases during Spoofing Episodes). The median share volume of new sell-side orders exceeded the median share volume of new buy-side orders placed during Spoofing Episodes. ¶ 82 (106% more); ¶ 96 (67% more); ¶ 138 (314% more); ¶ 199 (180% more) ¶ 226 (infinitely more, i.e., there were no new buy-side orders on median). As such, the price impact of spoofed Baiting Orders was not fully unwound: the downward pressure applied by sell-side orders exceeded the upward pressure applied by buy-side orders. As Professor Milgrom explains, this difference between the sell-side and buy-side pressure yields a persistent and permanent price impact.

328. The “permanent price impact” that Professor Milgrom discussed as resulting from manipulative trading is established in the economic literature and is not limited to same-day effects.⁷⁷ For example, one heavily cited peer-reviewed study shows that “both ask and bid tend to significantly increase (decrease) after the arrival of a buy (sell) limit order,” “quotes converge to a (new) permanent level” and “large volumes overbidding the prevailing quote cause a long-term upward movement of the bid.”⁷⁸

329. Thus, while each of Defendants’ Spoofing Episodes had a negative impact on the price of NWBO’s shares that may have been small, the placement and cancellation of Baiting Orders throughout the Relevant Period had the cumulative effect of driving NWBO’s share price down on a persistent basis throughout the Relevant Period.

330. This wrongful conduct proximately caused Plaintiff’s losses.

VII. THE MARKET FOR NWBO WAS EFFICIENT DURING THE RELEVANT PERIOD

331. During the Relevant Period, the market for NWBO was an efficient market for the following reasons, among others:

⁷⁷ Dr. Milgrom used the term “permanent price impact” to discuss an expert report previously submitted in that litigation by Dr. Craig Pirrong, which described peer-reviewed literature *that found the price impact of market manipulation lasted for more than one day*. Expert Report of Dr. Craig Pirrong, *Alaska Electrical Pension Fund v. Bank of America*, No. 14 Civ. 7126 (JMF)(S.D.N.Y.), ECF No. 503-4, Aug. 2, 2017, at *22 n. 14 (“Carole Comerton-Forde and Talis J. Putnins, *Measuring Closing Price Manipulation*, 20 J. FIN. INTERMEDIATION (2011) 135, present empirical evidence on the price effects of 184 manipulations of the closing prices on US and Canadian stock exchanges. During these manipulations, traders bought large quantities of stock shortly before the close. Comerton-Forde and Putnins find that (a) stock prices rose significantly at the close, and (b) the increases were only partially reversed the next day. The fact that the reversals were only partial indicates that the manipulations had a permanent effect on prices.”) (emphasis added).

⁷⁸ Nikolaus Hautsch & Ruihong Huang, *The Market Impact of a Limit Order*, 36 J. ECON. DYN. & CNTRL 501, 511, 5134 (2012).

- a. As a regulated issuer, NWBO filed periodic public reports with the SEC;
- b. NWBO shares traded at high weekly trading volumes;
- c. NWBO was eligible to file registration statements with the SEC on Form S-3;
- d. The market reacted promptly to public information disseminated by NWBO;
- e. NWBO regularly communicated with public investors via established market communication mechanisms, including regular disseminations of press releases on the national circuits of major newswire services and other public disclosures, such as communications with the financial press and other similar reporting services; and
- f. NWBO was regularly covered throughout the Relevant Period by the financial news.

332. As a result of the foregoing, the market for NWBO's shares promptly digested current information regarding NWBO from all publicly available sources and reflected such information in the price of NWBO's shares.

VIII. CLAIMS FOR RELIEF

A. First Claim for Relief for Spoofing in Violation of Section 10(b) of the Exchange Act of 1934 and Rule 10b-5(a) and (c) Promulgated Thereunder Against Defendants

333. Plaintiff incorporates by reference paragraphs 1 through 332 as if more fully set forth herein.

334. During the Relevant Period, Defendants engaged in and employed devices, schemes, illegal acts, practices, and a course of conduct, that were intended to manipulate the market price of NWBO shares which were listed and traded on the OTC Link LLC and NYSE ARCA Global OTC trading venues, and which operated as a fraud and deceit upon NWBO.

335. As a direct and proximate result of Defendants' wrongful conduct, NWBO suffered damages in that it sold shares at manipulative prices, in reliance on an assumption of an efficient market free of manipulation. NWBO would not have sold shares at the prices sold if they had been aware of Defendants' manipulative conduct which artificially affected the process of NWBO shares.

B. Second Claim for Relief for Spoofing in Violation of Section 9(a)(2) of The Securities Exchange Act of 1934 Against Defendants

336. Plaintiff incorporates by reference paragraphs 1 through 332 as if more fully set forth herein.

337. Based upon the conduct described above, Defendants' manipulative scheme violated Section 9(a)(2) of the Securities Exchange Act of 1934, which makes it unlawful to engage in a series of manipulative transactions "in any security . . . creating actual or apparent active trading in such security, or raising or depressing the price of such security, for the purpose of inducing the purchase or sale of such security by others."

338. By reason of the conduct described above, Defendants directly used the mails, or instrumentalities of interstate commerce, or a facility of a national securities exchange, to effect alone or with one or more other persons, a series of transactions in NWBO's securities that created actual or apparent trading in such securities or raising or depressing the price of such securities for the purpose of inducing the purchase or sale of such securities by others, engaged in the market manipulation strategy of spoofing which artificially affected the prices of NWBO's securities that NWBO sold.

339. Defendants' conscious misbehavior or recklessness artificially affected the price of NWBO's shares, that NWBO sold during the Relevant Period. NWBO's financial injuries would not have been as extensive but for the Defendants' conscious misbehavior or recklessness.

C. Third Claim for Relief for New York Common Law Fraud

340. Plaintiff incorporates by reference paragraphs 1 through 332 as if more fully set forth herein.

341. By placing and then cancelling Baiting Orders in their abusive spoofing scheme, Defendants each knowingly or recklessly injected into the market false and misleading information concerning the fake supply of NWBO shares that appeared available for trading. This interfered with the natural market forces of supply and demand and artificially drove the price of the shares downward. When the Company sold its NWBO stock during the Relevant Period, it suffered damages that were directly and proximately caused by Defendants' fraud.

342. When the Company sold its NWBO shares during the Relevant Period, it did not possess any specific facts demonstrating that the market price of NWBO's share was being manipulated and therefore, it relied on the efficiency of the market that had been unlawfully manipulated it suffered damages that were directly and proximately caused by Defendants' fraud. As a result, the Company suffered financial losses that were directly and proximately caused by the Defendants' fraud.

D. Fourth Claim for Injunctive Relief

343. Plaintiff incorporates by reference paragraphs 1 through 332 as if more fully set forth herein.

344. Plaintiff seeks to permanently enjoin Defendants from engaging in spoofing conduct that affects NWBO's share price. Defendants' actions identified herein have caused, continue to cause, and will cause future permanent and irreparable harm to Plaintiff.

345. Such harm is not merely pecuniary. Defendants' conduct has significantly impaired the ability of the Company to raise funds from the public markets, and thus could impact the ability

of the Company to get these life-saving cancer treatments quickly to market, robbing cancer patients of their lives and health.

346. The balance of the equities favors an injunction to prevent Defendants from continuing to spoof NWBO stock. The harm to Plaintiff and GBM cancer patients is significant. Through its clinical trials, DCVax®-L has shown unprecedented improvements over existing standard of care in long-term survival curve tails for both newly diagnosed and recurrent GBM cancer patients. In contrast, the potential harm to Defendants of injunction is insignificant; Defendants would merely be required to halt their illegal activity. Thus, the public interest, and public health, is best served by enjoining Defendants' spoofing behavior.

347. As noted throughout this Complaint, it is extremely likely that Plaintiff will succeed on the merits in this case. All evidence to be presented, including trading records and Defendants' own trading algorithms, will support the position that Defendants were manipulating NWBO's share price through spoofing.

348. As such, this Court should enter a permanent injunction enjoining Defendants from engaging in spoofing conduct that affects NWBO stock price.

IX. PRAYER FOR RELIEF

WHEREFORE, Plaintiff respectfully requests that this Court enter a judgment:

- A. Finding that Defendants violated the federal securities and New York state laws as alleged in this Complaint;
- B. Ordering Defendants to pay damages as a result of their unlawful conduct in an amount to be determined at trial;
- C. Ordering permanent injunctive relief as described herein;
- D. Awarding reasonable attorney's fees and costs together with all available

pre and post judgment interest; and

E. Granting such other and further relief as the Court deems just and appropriate.

X. DEMAND FOR JURY TRIAL

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, the Plaintiff demands trial by jury in this action of all issues so triable.

Dated: March 15, 2024
New York, New York

Respectfully submitted,

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